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THE·CONDOR
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Volume XIII November-December, 1911 Number 6

ANOTHER FORTNIGHT ON THE FARALLONES

By WILLIAM LEON DAWSON

WITH SEVEN PHOTOS BY THE AUTHOR

TO BE SURE it was the writer's *first* fortnight, so that the word "another" must be understood as recalling the visits of other adventurers instead of former personal experience. The Farallones are classical ground, and their ornithological resources have been so frequently and ably discussed in the pages of THE CONDOR and elsewhere, that one hesitates to add his mite to the imposing array of published notes. This fact also must excuse the writer for assuming in his readers a general knowledge of the location, topography and history of the Farallones, as well as of the chief characteristics of its immortal double quintette of breeding birds. But precisely because such a general interest has been aroused in this, the most populous breeding resort of the nearer Pacific Coast, a report of current conditions there may not be amiss.

Through the courtesy of the management of the California Academy of Sciences, which had permission to secure material for a magnificent "habitat group", the writer spent the fortnight, May 20 to June 3 inclusive, studying and photographing the birds of the Farallones.

The trip out was made in a "tug", properly written t$_{u}$g and ⌐^{u} or ^{t}u$_{g}$ (the ast-named, known as the *descensus ad inferno*, being the most excruciating, both n fact and in retrospect). Neptune demanded toll, and in default of payment gave his hapless victim a sound thrashing, after the rude fashion observed by the Skua

and others. A salute of seventeen hundred Murres was fired upon our arrival (only the east battery participating, however); and we were introduced to the fourteen Farallonians, from Mr. Rosendale, the able head keeper, to baby "Snoozer" Cobb, the idol of the thirteen grown ups. But the birds! They are the real proprietors. The pungent odor of guano smites the nostrils at six cable-lengths remove; while ashore it is fairly stifling to the novice. From pinnacle and arch and ledge comes the faint uproar of the Murres, always crowding, bowing, craning, gabbling; "sea pigeons" hiss and "sea parrots" flit by in silent platoons; while over all rises the discordant scream of the sea gull, the irrepressible, the irreconcilable, the insatiable Western Gull.

Humans sit only by sufferance on the edge of this avian volcano, while everywhere, by day or night, birds shift and seethe and gyrate in multitudinous kaleidoscopic succession. Birds—*Birds*—*BIRDS*. It is a sight to be remembered, and no enthusiasm of utterance on the part of visitors can quite spoil it for you when your turn comes.

Fig. 49. IN ANGRY MOOD
LOOKING NORTHEAST TOWARD SUGARLOAF

The weather was charming the first day or so. Not a breath of air stirred, and the sun was burning bright,—insomuch that a mere gross of photographic plates looked insignificant beside the boundless opportunity. But on the third day the northwest wind tuned up. It blew with steadily increasing pressure until photography was not to be thought of, and out-of-door study of any sort became a test of endurance. The mercury registered 48° at night and rose to 52° daytimes. After eight days the north wind fell and we had dull weather from the southwest. This brought the migrants, a motley and a woe-begone company. There is no cover on the island save a bit of a grove of Monterey cypress near the siren, and a hedge about a tiny garden in the keeper's yard. Yet, misguided and bewildered, the frail creatures came, day after day, Alaskan migrants, wanderers from the mainland, and exiles from the far East. The occurrence of unusual eastern forms has been noted on these islands before. Indeed, at the present rate it would not be surprising if

practically every species of the eastern *Mniotiltidæ* should report sooner or later at this inhospitable rock. We are not, of course, to suppose that it possesses unusual attractions for them. It is only that the slight percentage of alien blood always present in our coastwise migrations is here more readily, almost inevitably, detected.

As to the relative abundance of the staple forms the writer is ill-prepared to record conclusions. The Murres are said to be less abundant than in the days of the eggers. If this be so, it is because of the domination of the Western Gull—this and the ravages of the crude-oil plague. The region just outside of the Golden Gate is especially cursed by this unlawful practice, the cleaning out of the water (*and oil waste*) ballast of the "tankers" just previous to entering the harbor. That this is an active factor in bird destruction is attested by the abundance of oil-soaked carcasses which line the sparse beaches of the southeast Farallon. Murres are the chief sufferers, but Grebes, Loons, Scoters, and Pigeon Guillemots are frequent victims, and the destruction goes relentlessly on in winter as well as summer.

The statement sometimes made that Murres outnumber all other species combined upon the island is certainly ill considered. Cassin Auklets probably outnumber them two or three to one. The Petrels are a close second to the Auklets, and the Murres may come in third. Other resident species are represented in fair proportions,—all, that is, save the Farallon Cormorants. This colony has suffered from too much attention, human as well as Larine, and its numbers are slowly declining. But it is a very difficult task for humans to restore the "balance" of Nature. The wrinkled old dame is under no contract to maintain equality among the species, and *laissez faire* is perhaps the best motto for us. We can be virtuous (or at least moderate) ourselves, but we cannot settle disputes among Nature's children.

Below follows an irregularly annotated list of all the species observed on the southeast Farallon from May 20 to June 3, 1911.

1. **Gavia immer**. Loon. One adult seen in Fisherman's Bay within twenty feet of shore, June 2nd.

2. **Lunda cirrhata.** Tufted Puffin. Present throughout our stay and breeding to the number of several thousand. Athough eggs, and these somewhat advanced in incubation, were to be found at the outset, there was a notable increase in numbers of these birds during the earlier days of our visit, and this movement did not culminate till about the 28th of May. Breeding is conducted chiefly on the West End and on the higher portions of Tower Hill. The birds have little opportunity for digging in earth, and little occasion for providing fresh burrows, since crannies and crevices of every sort abound. Many of these retreats have been worked in the softer strata of the rocks themselves, and bear evidence of occupation measured by cycles rather than by generations. Many eggs or sitting birds are visible from the surface, and some of the nesting sites are nothing more than the innermost recesses of niches and caves occupied by Murres.

3. **Ptychoramphus aleuticus.** Cassin Auklet. The Cassin Auklets are *everywhere*. Burrows predominate, but there is not a cleft, nook, crack, cranny, fissure, aperture, retreat, niche, cave, receptacle, or hidey-hole from the water's edge to the summit of the light-tower which is not likely to harbor this ubiquitous bird. The interstices of the stone walls contain them to the number of thousands. Every cavity not definitely occupied by puffin, petrel, or rabbit is tenanted by an Auklet; and in many cases quarters are shared. If one's imagination is not sufficiently stimulated by regular occurrences, it will be jogged by appearances in un-

expected places,—an old nest of Rock Wren or Pigeon Guillemot, an inner recess of a Murre cave, an abandoned spur of a Puffin burrow, an overturned wheelbarrow or neglected board lying on the ground, driftwood on the beach—anything affording the slightest prospect of protection or cover. A pile of coal, sacked up and awaiting transfer from landing to siren, was found to be full of them. Since this was the rule from center to circumference of this magic isle, we conclude that the Cassin Auklet is the commonest bird on the Farallones, and estimates of population anywhere short of one or two hundred thousand do not take account of the facts.

The Cassin Auklet seems incapable of controlling the force of its flight, and the wonder is that the birds are not every one of them dashed to pieces in a single night. In this respect they remind one of nothing else so much as beetles or moths, which come hurtling into the region of candle-light, crash against the candle-stick, and without an instant's pause begin an animated search afoot. This crash-and-crawl method seems not exceptional but characteristic in the Auklet. It was especially noticeable in the paved area just outside our workroom door. Crash! announced the arrival of another food-laden messenger from the unknown deeps. The impact of collision with the building invariably stunned the bird so that it fell to the ground, but it immediately began a frantic search, and, as likely as not, before you could lay hands on it, disappeared in a crack under the doorstep. "*Right here! Right here!*" from a certain spot under the flooring proclaimed the home-coming, and so enthusiastic would be the reception accorded the dinner-laden parent that for a time all human conversation was suspended.

Fresh eggs were the rule throughout our stay, but this was only the average, and every phase of departure was noted up to chicks half-grown. Not enough birds *without* eggs were discovered to establish the fact that the birds occupy their burrows for some days previous to deposition; but such I suspect to be the fact, as is the case with other monotocous species.

4. **Cepphus columba**. Pigeon Guillemot. Present in small numbers from the first, but attaining a maximum of about two hundred June 1st. The gentle "sea pigeon" nests in crevices anywhere from about twenty feet above tide up to the summit of Tower Hill. Its favorite nesting range, however, is an immense rock-slide on the east slopes of Tower Hill. Quite contrary to any previous experience with these birds (in Washington), I found all the nests *carefully lined*, usually with rock flakes, sometimes with pebbles or bits of rusty iron.

5. **Uria troille californica.** California Murre. Because of its fabled abundance and its history of unexampled persecution at the hands of the "eggers", the liveliest curiosity possessed my mind regarding the present status and behavior of this species. In both matters I was destined to be disappointed. For some reason this Murre has not profited by full protection as might have been expected. It has neither increased in numbers nor gained in confidence. The fault lies, I think, chiefly with the gulls, which have profited enormously under near immunity from human attack. To be sure, the human is oftenest the occasion, but seldom the cause, of the wrong-doing. Our presence was hailed with glad acclaim by the gulls, who, though somewhat fearful for their own treasures, are always eager for an excuse to plunder "the ledges". In fact, the Larine outcry always seemed to be nine-tenths make-believe, being intended to alarm the galleries instead of voicing a personal anxiety. Obedient to the tradition, the Murres begin to shift and edge away when the gulls assure them that yonder object picking its way carefully over the rocks is dangerous. It looks harmless, but who knows? A gull swoops near to the ledge and shrieks, "Fly for your lives, you fools!" The timorous obey

promptly; the rest crowd to the edges. Fear becomes panic, and panic rout; while the gulls swarm down to feast on the abandoned eggs.

It is possible that conditions would improve were the island absolutely uninhabited. The "West End" is preserved from human invasion with a fair degree of rigor; but ten men marooned on government service require some little breathing space and cannot always wait on the affairs of foolish Murres. The tradition holds, and will till the end of time—or until such time as the Government decides which it will protect, Murres or Gulls.

There was a steady increase in the number of Murres hauling out upon the ledges up to May 30, when the movement ceased. The Murres enjoy a wide and practically general distribution throughout the group, but the larger colonies are on

Fig. 50. A MOUNTAIN RANGE IN MINIATURE
VIEW ON SOUTHEAST FARALLON LOOKING SOUTH

the off-shore rocks and outermost promontories. Thus, Seal Rock, or "Saddleback", as it is called locally, lying southwest from the keepers' houses, was black with them above the range of the lions. In like manner, Sugar Loaf and its associated rocks on the northeast presented most favorable conditions. A flat-topped rock at the extreme west end and the great arch hard by, perhaps came next in point of numbers, but the slopes and ledges on the north side of Maintop harbor thousands, and Indian Head became so popular latterly that we did not go near it. The "great Murre cave", likewise, at the extreme eastern end of the island, we did not dare visit latterly, although it is quite certain that it does not nearly measure up to its ancient standards in point of population.

A reliable estimate is difficult to make, but I doubt if over 20,000 Murres now haul out on the southeast Farallon and its outliers.

While reviewing a ledge one day in company with Mr. J. Rowley, I noticed a bird which apparently had its back to us while all the others were facing. Closer examination showed that it too was facing us. Its underparts were the same color that a Murre's back should be, sooty black. A lucky shot secured it, and it proved to be a male bird with breeding organs in active condition, a melanistic specimen without a trace of white in its plumage.

6. **Larus occidentalis.** Western Gull. These birds afforded the dominant note of life on the West End, the fashionable residence quarter of the Farallones. They nested anywhere from beach to pinnacle, and a careful examination of near a thousand nests discovered a singular uniformity of type in coloring of the eggs. This is evidently a closely inbred colony, free for ages from admixture or disturbing influences. I have seen a four times greater variation in a small colony of not forty pairs on a rock off the coast of Washington, debatable ground between *occidentalis* and *glaucescens*. While most nests contained three eggs, three clutches of four were found, the eggs being in each instance unquestionably the product of a single bird.

In several instances I detected cannibalism, if such a harsh term can be applied to a habit of sampling eggs of the same species. In each case the offender appeared to have leisure for the enjoyment of the unlawful feast, but it is an open question whether they were cases of piracy or worse. Certainly the gulls are very jealous of each other, and the shifting readjustment which accompanies the progress of the bird-man is always attended with many sharp passages-at-arms among the gulls. Conscience plays a proper part and the jealous owner always wins.

Possibly three thousand pairs nested this season.

7. **Larus heermanni.** Heermann Gull. Only one individual twice seen. The second time he was found in company with Western Gulls, a member of a Murre-marauding company.

8. **Oceanodroma kaedingi.** Kaeding Petrel. Our tents were finally pitched under the lee of Tower Hill on the south side, and within hailing distance of the Government Wireless Station. Near us were several half-ruined stone walls, the relics of occupation by the eggers, or possibly by their predecessors, the Russian sea-otter hunters. These walls resounded nightly to the incessant cries of Petrels as did every other wall on the island. On the evening of May 30, Leon Garland one of the wireless operators, secured a white-rumped petrel in his tent, whither it had been attracted by the light. On the morning of the 3rd of June, Mr. Garland brought in another Kaeding Petrel, which he had secured in one of these old stone walls near his tent, and he declared that the bird had been found sitting on an egg, although the latter was broken. Mr. Rowley joined forces with him and spent the best part of the day tearing down the walls of this and neighboring enclosures. Three more specimens were found along with considerable numbers of *homochroa*, which occupied the same area; and two eggs of each species, the first of the season, rewarded the search. Although precisely similar conditions obtain elsewhere, no other Kaeding Petrels were encountered on the Farallones

9. **Oceanodroma homochroa.** Coues Petrel. Either this species has notably increased of late, or else earlier visitors were inclined to underestimate its numbers. We found them well distributed throughout the main island. Not only are all the stone walls alive with them, but they occupy the minor rock-slides along with the Cassin Auklet, and they even burrow in the level ground in front of the keepers' houses. In investigating the drift area on Franconia beach, we found almost

as many Petrels as Auklets skulking under logs and planks. In point of abundance they are easily third, possibly second on the island.

It is evident that these Petrels have a lengthy season of courtship during which they spend their nights ashore, chiefly in their burrows, and return to the sea daytimes. This is followed by a "honeymoon" period of some duration, presumably a week or more, in which both birds remain ashore all the time. As soon as the egg is laid incubation begins, and the other bird retires to sea to forage. Precisely what the division of labor is from this point on as between male and female remains to be determined, but it is certain that the male is often found alone upon the egg.

The former name, "Ashy" Petrel, is very misleading. Its use suggests a type of coloration similar to that of the Fork-tailed (*O. furcata*), whereas the general

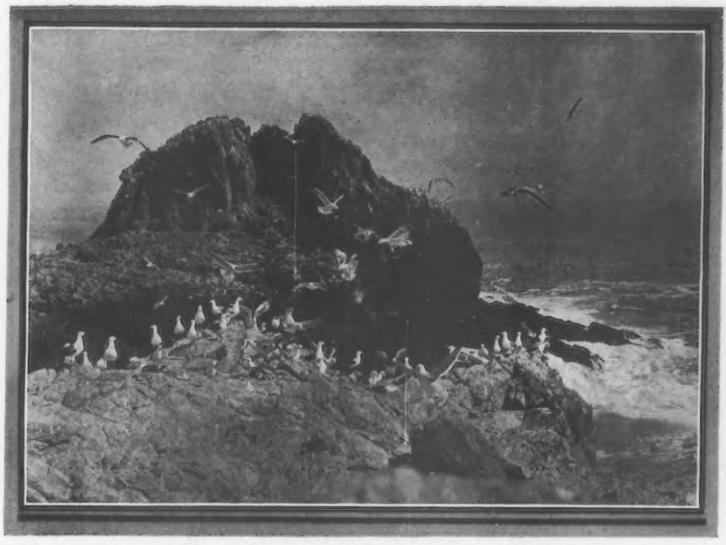

Fig. 51. THE BANQUET TABLE
WESTERN GULLS ROBBING A MURRE LEDGE
INDIAN HEAD IN THE BACKGROUND

cast of color is only a little less sooty than that of *kaedingi* or *leucorhoa*. It does incline to "plumbeous", but is much nearer black than "ashy". Several friends appealed to, agree with me that it is time for a correction, and the name of the original describer, Coues, is respectfully recommended.

10. **Phalacrocorax auritus albociliatus.** Farallon Cormorant. The colony on Maintop, the only one remaining in the Farallones, is now reduced to about thirty-five pairs, and of this number only fifteen were succeeding in raising families this year. The story of the steady persecution to which the confiding members of this historic colony have been subjected would not make a pretty one in print. The human pressure has been removed (nearly, not altogether) latterly; but the gulls are crowding it to certain extinction. The Shags are standing by their guns, and their bravery makes one long to do something on their behalf. By cautious

advances I was able to make friends with two of the most devoted mothers, and I could pause unquestioned within two feet of either.

Owing chiefly to depredations, nesting, at the time of our visit, May 21st, exhibited every stage from fresh eggs or empty nests to those containing young several days old. Our own judicious conduct disappointed the gulls, who stood about expectantly, awaiting their turn. No general exodus occurred at any time, but it was easy to note losses due to Larine vigilance during our absences. Only one bird, which we called "the bride", retained the earlier nuptial plumes. She was exceedingly wary, and her single egg having been abstracted by gulls, she and her mate deserted the colony outright.

In striking contrast with their kindred, the White-crested Cormorants (*P. a. cincinatus*) of the upper coasts, which invariably use sticks, these Farallon Shags employ only weeds and grass in nest construction. The chief ingredient is a coarse, yellow-flowered composite, known locally as Farallon Weed, and the resulting crater-shaped nest is not materially different from that of a Brandt Cormorant.

11. **Phalacrocorax penicillatus**. Brandt Cormorant. Fortunately for themselves these shags are exceedingly wary. It was only by stealth that the Academy staff could secure the necessary specimens for their group work, and a gun-shot always meant suspension of nest-building operations for a day or two thereafter. A few pairs occupied the old site on the northwestern slopes of Maintop, and a single egg was seen, May 21st; but the succeeding ten days witnessed a notable increase in their numbers. By June 1st they were all fairly at it, some 600 of them, and bound to succeed if not further molested.

This colony evidently occupied, last season, the extreme western end of the island, in the vicinity of the "great arch", as a number of wind-dried squab carcasses attested. Brandt Cormorants have no such strong local attachment as birds of the *P. auritus* group, and are quite ready to shift camp for prudential, or it may be for sanitary reasons.

12. **Phalacrocorax pelagicus resplendens.** Baird Cormorant. These wiry little Shags were fairly well distributed along sufficient declivities throughout the West End. Nest-building was in progress at the time of our arrival, but no eggs were seen during our stay.

13. **Phalaropus fulicarius.** Red Phalarope. A page from my note-book under date of May 25th may be of interest:

"Oh, bring me a new dictionary! At least a dozen fresh-minted adjectives I require, caressives, diminutives, and felicitatives. Four Arctic emigrants, ticketed for waters in and about Peary's Pole, have adopted me for their god; and there is nothing they will not do for me, save keep outside the minimum focal length (about 2½ feet) of my camera. Three Red Phalaropes, all females, I take it, although none of them is in highest plumage, and one Northern, also a female just under "high", are pasturing at my feet in a brackish pool some twenty feet long, ten wide, and two deep. The waters of the pool teem with a minute reddish crustacean (?), shaped like an ant, less than a thirty-second of an inch in length, and incredibly nimble. The insects progress by leaps, and are visible only at the moment of arrival. Yet these birds gobble them up one at a time with unerring accuracy, and with a rapidity which is nothing short of marvelous. The Reds work habitually at the rate of five dabs per second, i. e. 300 a minute; while the Northern, with a longer beak and a much daintier motion, works only half as fast. The birds are fast livers and they void the cloaca at intervals of two or three minutes, roughly guessed. The excreta are chiefly of a vivid rose-red color with

an attendant portion of pure white—the same in color, by the way, as those cast by the Murres along the east wall of Shubrick point.

"As I said, these birds will do anything for me. By stealthy approach and good behavior I have won their complete confidence, taking all the pictures wanted at focal length, the birds passing repeatedly within that distance as the camera is pointed diagonally down at them. After using up my plates I lay down by the water's edge, and the birds repeatedly came nearer to my face than my hands were. Also, when I stretched my hand out slowly into the water, one ventured within six inches of it. Yet the Phalaropes are perfectly aware of my presence, and they give a little start or a warning peep every time an unusual movement or the slightest sound escapes me."

Fig. 52. FARALLON CORMORANT BROODING YOUNG

Good-sized flocks of these birds were tossing about in the lee of the island almost continually during the prevalence of the northwest wind, and little wisps of them were frequently seen flitting to and fro between the indentations of the tide. Many birds were killed at night by striking against the single telephone wire which stretches east and west along the narrow portion of the island. Occasionally small groups of these Phalaropes were flushed from the ground, and while I was settled in the tent I several times saw them take refuge behind stones to avoid the sweep of the wind.

14. **Lobipes lobatus.** Northern Phalarope. Great shoals of these Phalaropes lay off-shore on the lee side of the island until the wind veered to the south.

Although naturally frailer than the Reds, birds of this species did not so frequently resort to the shore; and in the flocks which visited the tidal channels they were usually in the minority.

15. **Heteractitis incanus.** Wandering Tattler. This is one of the first birds to extend felicitations upon our arrival; and although not a resident, there is none on the Farallones more characteristic at this season, nor any better fitted to symbolize the wild isolation of the group. During the first week of our stay there were not less than ten birds of this species, well distributed, which quavered and teetered, or fled, as often as we approached the surf line. But their numbers had dwindled to two by June 1st.

Contrary to earlier statements these Tattlers do spend a considerable portion of their time upon the higher ground. The tiny boulder-strewn meadow surrounding my earlier camp (just east of Franconia beach) was a favorite resting place for them, and I am inclined to think the birds spent the night there, for some were invariably startled upon my first appearance mornings.

Having a common affection for the tide reefs, Wandering Tattlers are not infrequently found in loose association with Black Turnstones; but when put to flight they pay no attention whatever to the fortunes of their chance shipmates, nor to others of their own kind. Preferably, the Wandering Tattler, like Kipling's cat, walks by himself.

16. **Arenaria melanocephala**. Black Turnstone. Several small flocks—never more than six or eight birds at once—were seen. The Turnstones sat closer and flew farther when disturbed than the Tattlers; and I did not discover them elsewhere than on the dun-colored reefs. None were to be seen after June 1st, and I think not after the rise of the southeast breeze on the 29th of May.

17. **Zenaidura macroura carolinensis.** Mourning Dove. A single bird, wind-driven and desolate, was sighted on the morning of May 24th. It probably lingered through our stay, as it was several times reported by one of the keepers.

18. **Speotyto cunicularia hypogæa.** Burrowing Owl. A single individual, a sole survivor, we were informed, of a former small breeding colony, was several times noted upon the grassy flat south of the steam siren. The bird was almost black to appearance, and so, very desirable; but he proved to be correspondingly modest.

19. **Myiarchus cinerascens cinerascens**. Ash-throated Flycatcher. Two birds were seen haunting the cypress "grove" on the evening of June 1st, and a specimen was taken the following morning.

20. **Nuttallornis borealis**. Olive-sided Fycatcher. The most notable arrival of June 2nd. Several individuals were seen hawking at insects in situations which would much better have suited the Say Phoebe; and one was taken.

21. **Myiochanes richardsoni richardsoni**. Western Wood Pewee. On the morning of May 29th, the weather having moderated, and the wind having changed to the southwest, there was a notable invasion of the island by frail migrants, chief among whom were these Pewees, present to the number of a dozen or more. There was not room for them all in the tiny cypress grove, which alone offered congenial shelter, so they deployed over the rocks, seeking sustenance of the cliffs in quite unfamiliar fashion. Although so evidently ill at ease, none of the Passerine forms appeared to know when to leave or how to make their way to the mainland shore; and I am inclined to think that the majority of them wear themselves out miserably in a vain attempt to get adjusted to a strange environment rather than risk the dangers of further passage over seas.

22. **Empidonax difficilis difficilis.** Western Flycatcher. One taken and another seen near the siren on May 29th.

23. **Empidonax trailli trailli** (?). Traill (?) Flycatcher. An unknown Empidonax, certainly not *difficilis*, was seen on the 29th in company with a Western Wood Pewee, but it could not be secured.

24. **Corvus corax sinuatus.** Raven. The nest of the only pair of birds claiming residence on the island had been twice broken up this spring by zealous keepers in the name of their defenceless hens. (It is to laugh, raising *chickens* on the Farallones.) The birds lingered for some days, but evidently gave up and left for the mainland.

25. **Molothrus ater artemisiæ.** Cowbird. A solitary individual, marked down on the 1st of June and secured on the 2nd, is recognized by Mr. Grinnell as

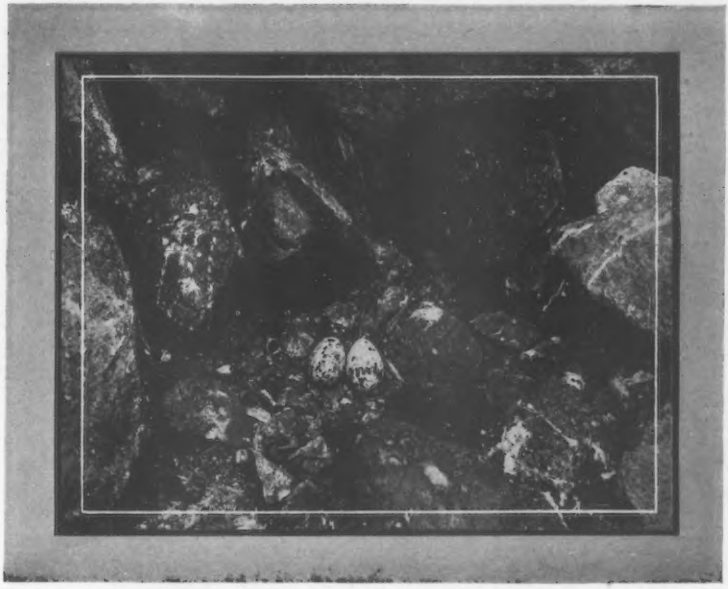

Fig. 53. NEST AND EGGS OF PIGEON GUILLEMOT

belonging to his recently elaborated form from the northern interior. Its occurrence so far west of its normal range is certainly of interest.

26. **Carpodacus mexicanus frontalis.** House Finch. Encouraged by the shelter of the cypress grove and Mr. Rosendale's tiny garden, a small colony of these finches have maintained themselves for some years past. Several broods were being successfully reared at the time of our visit, although the busy households of the cypress grove were visibly embarrassed over the presence of so much unexpected "company" from the East and South.

27. **Passer domesticus.** English Sparrow. More unwelcome than harpies at the feast of Ulysses, these wretched interlopers have invaded this sanctuary also. Small companies of them from San Francisco visit the islands yearly and return

shortly, but several seen at this season evidently intend residence. One leering male in the cypress grove I pasted for luck.

28. **Zonotrichia coronata.** Golden-crowned Sparrow. A handsome male was sighted near the landing on the morning of June 2nd.

29. **Spizella passerina arizonæ** (?) Western (?) Chipping Sparrow. A member of this June band seen in the Monterey Cypress grove—again on the 2nd. It might possibly have been an Easterner.

30. **Passerella iliaca townsendi.** Townsend Fox Sparrow. A number of Fox Sparrows seen from May 31st on were all apparently of the exact form of the one taken, which has been kindly identified by Mr. Grinnell. The "Committee" allows *townsendi* to venture only as far south as Humboldt County in winter, so these rascals from the Farallones were playing a bold hand.

31. **Passerina amœna.** Lazuli Bunting. A handsome male was seen by Mr. Rowley on the first of June, and again by myself on the day following.

32. **Piranga ludoviciana.** Western Tanager. An adult female, driven by necessity, fed over the stony pastures which were the rightful heritage of Cassin Auklets and Rock Wrens—June 1st.

33. **Tachycineta thalassina lepida.** Northern Violet-green Swallow. A solitary male hawked bravely about the inhabited portion of the island all day June 1st, and made an early, and a chilly, bunk on the telephone wire that night.

34. **Bombycilla cedrorum.** Cedar Waxwing. A single bird well seen.

35. **Dendroica æstiva rubiginosa** (?). Alaska (?) Yellow Warbler. A solitary specimen, a female, was several times sighted in the cypress grove, beginning May 29th. The sub-specific name assigned is a mere guess based on the bird's tardy appearance.

36. **Dendroica magnolia.** Magnolia Warbler. These, the daintiest as well as the most conspicuous of the eastern wanderers, were several times seen on the 29th of May, and a handsome male was secured on that date. Another male, bewildered and subdued by the strangeness of his surroundings, was encountered on the steep trail leading out of the Raven cave on the West End, and here, where his only companions were shag-flies and sea fowl, he endeavored to maintain himself for several days. A female was taken from the cypress grove on June 2nd.

37. **Dendroica virens.** Black-throated Green Warbler. A female was secured at close range from the ground west of Keeper Rosendale's house. Unfortunately the specimen is badly shattered, but the remains are in the Academy collection to attest this new record for the Pacific Coast. [Previously reported in the September CONDOR.]

38. **Dendroica townsendi.** Townsend Warbler. A male well seen in the Monterey cypress grove June 1st.

39. **Seiurus aurocapillus.** Oven-bird. The presence of this species, not previously reported west of the Rockies [save in the September CONDOR] gives character to the little bird-wave whose last beat broke on this occidental strand, and serves to mark its members for suspicion as wanderers rather than misdirected Alaskan pilgrims. This bird was caught in a vacant room of the assistant keeper's house, a male in high plumage and perfectly preserved. Another was seen a few minutes later outside the house, and it haunted the neighborhood during the remainder of our stay.

40. **Wilsonia pusilla chryseola.** Golden Pileolated Warbler. Seen on the 21st of May.

41. **Setophaga ruticilla.** Redstart. A second year male was closely observed in the cypress grove on the evening of June 1st.

42. **Salpinctes obsoletus obsoletus.** Rock Wren. The presiding genius of the Farallones, fearless, inquisitive, thrifty, and always happy. There is not a secret of the island which the Rock Wren does not know, for she pokes and pries into every crevice, examines every movable fragment of rock, stick, or bone, with a view to appropriation, scrutinizes every form of insect life with a view to assimilation, bugles from every rock-crest, greets the descending light-keeper in the cool gray of the morning, chirrups at "Snoozer", the island mascot, as she passes in her go-cart, titters at the Cassin Auklet brooding in her gloomy cell, mocks at the dignified "sea parrot", and stirs things up generally.

At the time of our visit the first broods of young were shifting for themselves, and the adult population was busy with second nesting. Five occupied nests were found, besides several promising "empties", without half trying. Of these, two contained pure white eggs, five and six respectively. The set of five was normal in

Fig. 54. WAIFS OF THE SEA
PHALAROPES, RED AND NORTHERN, FEEDING ON SOUTH SIDE OF SOUTHEAST FARALLON

size and shape; but the eggs of the larger set were much undersized, and absurdly shaped, being chopped off, squared, or flattened, like plaster pellets done by hand. One egg, by way of exception to these exceptions, was elongated, instead of shortened—evidently amateur work.

All the Rock Wrens wore their old clothes. Either their seclusion has made them indifferent to the prevailing fashions, or else they had worn out their wedding duds earlier in the season. The "splitters" have had their jealous eyes on these Farallon birds, but so far the wily Wrens have managed to keep within the bounds of Salpinctean propriety—a wide enough range, to be sure.

43. **Hylocichla ustulata ustulata.** Russet-backed Thrush. Several birds arrived on the morning of May 29th, and they skulked about the rock-slides or central elevations during the remainder of our stay. One was taken from the cypress grove.

SOME ROBINS' AND MOURNING DOVES' NESTS IN THE LOWER YAKIMA VALLEY, WASHINGTON

By CLARENCE HAMILTON KENNEDY

WITH TWO ILLUSTRATIONS BY THE AUTHOR

WHEN I first came into the Yakima Valley, I was pleased to be greeted by an old friend, the robin (*Planesticus migratorius propinquus*), slightly paler than his eastern relative and with the same cheerful note and mien; but I was surprised to see pair a complacently building a nest on a beam in a cow

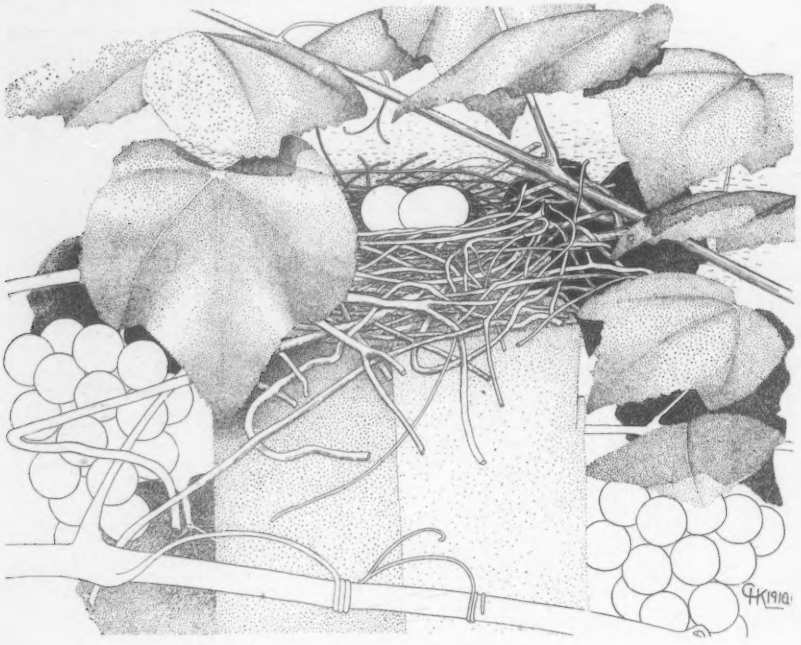

Fig. 55. A MOURNING DOVE'S NEST ON A POST

shed. However, on considering further I ceased to wonder. The Lower Yakima Valley, lying as it does in the Upper Sonoran Zone, is a sage-brush desert except along the streams, where are thickets of willows and cottonwoods, and in its more level portions, where are now many square miles of irrigated fields and orchards.

Because of the past scarcity of timber, the robins and also Mourning Doves (*Zenaidura macroura carolinensis*) appear to have lost to some extent their desire and ability to build in trees. Now that large areas of the valley are covered with orchards and that shade trees are numerous, they yet occasionally revert to their former habit of building in places other than trees. It is possible, though, that as irrigation is recent here, the robins and doves have spread out from their formerly more restricted habitat about the water holes and streams, into the sur-

rounding irrigated portions of the valley ahead of the development of a sufficient number of trees large enough to be suitable for nests.

The robin's nest mentioned above was begun on May 2, 1910, and was constructed of alfalfa and weed stems plastered together with mud and lined with rootlets after the usual robin style, but it was placed on a six inch beam close under the roof of an open cow-shed. The nest was about six feet above the ground. On May 15 it was nosed down by an inquisitive horse, breaking the three eggs which it contained. A nest was built shortly afterward, possibly by this same pair, in a cork elm tree on the lawn. This nest was built in a heavy fork about twelve feet above the ground.

These robins perhaps lacked a strong tree nesting instinct, because they con-

Fig. 56. A MOURNING DOVES' NEST ON THE GROUND

structed a loosely attached nest. Sufficient mud and other material had not been put in the base of the nest to wedge it solidly in the tree fork. This nest, with the four eggs which it contained, was destroyed by being blown out of the tree during a moderate gale on June 9, 1910.

During this same season of 1910 a pair of robins built a nest in the fork of a cherry tree about four feet above the ground. This pair was successful in rearing its young. During the present season, 1911, a pair of robins built in a honeysuckle vine on a porch within five feet of a door, through which people passed frequently. The nest was well built and of the usual type. There were three eggs in the clutch, which were hatched and the young successfully reared.

Mourning Doves do build on low horizontal limbs and in broad forks as is their

custom in the eastern states, for just recently, August 19, 1911, I observed on the Herke ranch in Parker Bottom a dove's nest on a horizontal limb of a willow and another, from which the young had just flown, on a horizontal apple limb. But as is the case with the robins they build in unusual places as well. The ordinary place to find doves' nests on this ranch is on the flat top of a vineyard post, where the nest is nicely shaded and screened from view by the grape leaves.

Two such nests were found in 1910, one of which is shown in the accompanying illustration (fig. 55), and two have been found this season, 1911. In all four cases the nests were well built for doves' nests, and the young were reared.

The second illustration (fig. 56) shows a dove's nest on the ground. This nest was at the edge of an alfalfa field just above the perpendicular side of a narrow ravine, the parent doves alighting and leaving from the brink of the bank. Sage brush rubbish had been scraped to this side of the field in clearing it, and in this half decomposed trash the doves had made for a nest merely a slight depression, apparently having brought nothing in the way of material to the nesting site. This nest was discovered on June 15, 1910, when the young were apparently but two or three days old. They left the nest on June 23.

It seems hardly probable that these birds, particularly the robins, which differ in other characters from their eastern relatives, should ever, even with the changed environment of irrigation, become as rigidly tree nesting as their eastern relatives.

However, it will be interesting to observe how these desert robins and doves will adapt their nesting habits to the coming change of environment.

NESTING NOTES ON THE DUCKS OF THE BARR LAKE REGION, COLORADO

By ROBERT B. ROCKWELL

PART II

WITH TEN PHOTOS

PINTAIL (*Dafila acuta*)

THE effect of irrigation and land cultivation upon the distribution of bird life, was clearly illustrated by our field work among the Pintails. Cooke's "Birds of Colorado" published in 1897 classified the Pintail as a "rare summer resident", with the qualifying statement that it usually bred from the northern states northward. This statement was no doubt largely correct, when it was published, but ten years' time, with the accompanying development of large reservoir and canal systems, and the cultivating of thousands of acres of fertile land, has wrought a decided change in this condition. Upon the beginning of our work* along the Barr Lakes in 1906, we found the Pintail very much in evidence throughout the spring and summer, and their nests were found in greater numbers than those of any other species of duck except the Blue-winged Teal.

It was a difficult matter to reconcile ourselves to the fact that the extremely shy, wild and racy birds that eluded our carefully placed and concealed blinds, and

* The notes upon which this paper is based were taken in company with Mr. L. J. Hersey.

Fig. 57. NEST OF PINTAIL WITHIN 18 FEET OF MAIN LINE OF BURLINGTON ROUTE

Fig. 58. A CLOSER VIEW OF THE PINTAIL'S NEST CLOSE TO RAILROAD TRACKS

kept just out of gunshot with an accuracy that was almost uncanny during the spring shooting season, could, in a few short weeks, be converted into the comparatively tame and unsuspicious birds that the nesting female Pintails proved to be. Yet the sleek, well dressed male with his conspicuous white waistcoat and brown head was at all times wary and difficult to approach, and very few times did we approach to within gunshot of him, although his solicitude for his mate and the nest was quite apparent.

We found nests of the Pintail in widely diversified locations but there was a peculiar similarity noticeable in all of them which was very different from our experience with the teal.

The first nest, found May 11, 1907, was probably the most unusually located nest of the Pintail on record. It was just a trifle less than eighteen feet from the rails of the main line of the Burlington Route, over which a dozen or more heavy trains thundered every day, and well within the railroad right-of-way where section hands and pedestrians passed back and forth continually. The mother bird had found a cavity in the ground, about eight inches in diameter and eight inches deep, and had lined it with grass; and the two fresh eggs which it contained on this date were deposited without any downy lining whatever. The female flushed as we passed along the track about twenty feet distant, thus attracting our attention. A week later (on the eighteenth) the nest was fairly well lined with down and contained nine eggs, one egg having apparently been deposited each day. On May 24 the nest contained eleven eggs and the parent was much tamer than on the two preceding visits, allowing us to approach to within fifteen feet of her, and alighting within twenty yards of us upon being flushed.

Fig. 59. PINTAIL'S NEST ON HIGH PRAIRIE ANEARLY MILE FROM NEAREST WATER

Another peculiar nest was found May 30, 1908, containing eleven eggs which hatched during the first week in June. This nest was a depression in a perfectly bare sandy flat without a particle of concealment of any kind. The cavity was located in the most exposed position within hundreds of yards, and was fairly well lined with weed-stems, grass, etc., and well rimmed with down. The brooding female was very conspicuous against the back-ground of bare sand, and could be readily seen from a distance of fifty feet or more. This bird was rather wild and flushed while we were yet some distance from the nest.

Fig. 60. BULL-SNAKE ROBBING PINTAIL'S NEST

Fig. 61. NESTING SITE AND NEST OF REDHEAD

Several nests were found far back on the dry prairie and high above the high-water mark, one being almost a mile from the lake. These nests were usually well concealed in the weeds, and were warmly lined with down of a somewhat darker shade than that found in the teals' nests. The birds were close sitters, often allowing us almost to step upon them before taking wing. The generous lining of down which was found in nearly all the nests was almost invariably used to cover the eggs during the absence of the parent, and many nests that had little or no concealment were difficult to locate after having been cunningly concealed by the mother duck, even though we knew almost the exact location. The bulky mass of down was pushed outward and upward when the bird was on the nest until it came well up about her body, but this very thing made the nests much more conspicuous when the birds were flushed unexpectedly, without sufficient time to

Fig. 62. MIXED NEST CONTAINING FIVE EGGS OF RUDDY AND FIVE OF REDHEAD

cover the eggs. One typical nest was found May 31, 1908 deeply sunk in a dense growth of very tall, rank grass on a small island in the lake, which would not have been discovered but for this fact.

On June 8, 1907 a nest was found under a spreading bunch of alfalfa on a small ridge in a low marshy meadow. On June 22, it contained nine eggs. The brooding female was unusually tame, and repeated attempts were made to photograph her, several of which were nearly successful. June 29 the female was still incubating but the nest contained only five eggs. The next day we found it occupied by a bull snake three feet nine inches in length, which had just swallowed an egg, only two of which now remained in the nest. It took the snake some time to force the unbroken egg (which was somewhat larger than its own body) down its throat about three inches, and it was regurgitated instantly upon our touching the

snake with a stick. Upon dissecting it we found no signs whatever of the other eggs, a fact which raised the question as to whether the two which had disappeared since the preceding day had been entirely digested (shell and all) within that time, or whether more than one snake was pilfering this particular nest. A fortunate exposure caught the egg just as it was being disgorged from the snake's mouth.

Eight to eleven eggs apparently constitute full sets, and ten was the average number found, but one nest was found containing five heavily incubated eggs, which hatched July 6, 1908. The earliest nest found during the three seasons was May 11; the first egg in this set was probably laid May 9. The average date for complete sets was the last week in May, and many of the eggs hatched during the first week in June.

Broods of young birds were kept well concealed by the parents until able to

Fig. 63. NESTING SITE OF RUDDY AND CANVASBACK. THIS MUSKRAT HOUSE CONTAINED AT THE SAME TIME TWO NESTS OF THE RUDDY AND ONE OF THE CANVASBACK

care for themselves. We saw but two or three broods, but in each case the mother was very bold, using every possible subterfuge to lead us away from her babies.

REDHEAD (*Marila americana*)

Cooke, in the second supplement to "Birds of Colorado," published in 1900, states that "facts are accumulating which make it probable that this species will in the near future be accounted among the breeding birds of Colorado," and this prediction was fully verified by our discovery of several nests during 1906, 1907 and 1908. Five nests were found which we could positively attribute to the Redhead, and a few others which in all probability belonged to this species, but which we were unable to identify beyond doubt. Further than this enough pairs of Redheads as well as single males in full breeding plumage were seen during May, June and July of each of these years to satisfy us that the birds were breeding along

the Barr chain of lakes in goodly numbers, and that the few nests examined by us were but a part of the total number.

The Redheads' nests, like those of the teal, exhibited a wide variation in structure and location. The first two nests were found June 10, 1906. These, containing five fresh eggs and nine incubated eggs, respectively, were within two feet of each other, in burrows in the top of a large musk-rat house at the edge of a small lake, in a sparse growth of cat-tails. The birds had burrowed in about eighteen inches, lined the cavity with down, and deposited the eggs at the end of the cavity. A careful examination of all the musk-rat houses seen (and they were so conspicuous that in all probability none was overlooked) during the balance of 1906 and the full nesting seasons of 1907 and 1908, failed to reveal any other similarly located nests of this species.

Fig. 64. NEST AND EGGS OF CANVASBACK IN BURROW IN SIDE OF MUSKRAT HOUSE

On May 31, 1907, we found a beautiful set of eleven fresh eggs in a large, bulky nest somewhat resembling an overgrown nest of the coot, but much less compact and not so neatly cupped or lined as the average coot's nest. There was little or no downy lining in the nest which was built in an average growth of cat-tails over about eighteen inches of water, and some twenty yards from the open water of the lake. There was no apparent attempt at concealment, and it was very conspicuous owing to its large size. The female flushed wildly, with a good deal of noise, when we were fully forty yards from the nest thus attracting our attention to it. Eight of these eggs hatched on or about June 20, the remaining three being addled.

The finest nest of this species which came to our attention was found June 15, 1907, in a dense cat-tail swamp between two small rush-encircled lakes. It was a beautifully built structure of dead cat-tail blades, mostly broken into small pieces, well built up above the surface of the water (which at this spot was only a few inches deep), deeply cupped, plentifully lined with down, and well concealed in the dense cat-tail growth. This set hatched on or about June 30. A photo of this nest appeared in the July, 1909, CONDOR.

Within about fifty yards of the nest found May 31, on June 8 we found one built in the midst of a solitary clump of cat-tails, containing two eggs of the Redhead and four of the Ruddy Duck. This was made entirely of dead cat-tails, and built in such a manner that the cat-tail clump entirely surrounded and covered it,

Fig. 65. NEST AND EGGS OF RUDDY IN BURROW IN SIDE OF MUSKRAT HOUSE

affording good concealment. A week later this nest contained two Redhead's eggs and six eggs of the Ruddy, and on June 22, it contained five eggs of each. Whether this nest belonged to a brooding Redhead or a Ruddy the most careful stalking did not reveal, as the bird invariably skulked off through the dense cover before we were able to identify it.

The peculiar manner in which eggs of more than one species were deposited in the same nest was a feature of special interest to us, and we tried persistently to unravel the mystery; but although we tried many different methods, we were unable except in one instance, to flush the parent bird from any of the nests containing mixed sets. In fact we did not flush any Ruddys or Redheads from nests except in the one case mentioned above.

CANVASBACK (*Marila valisineria*)

Probably the most important feature of our field work at Barr was that of establishing beyond question, the Canvasback, as a Colorado breeder. Although we made a special effort throughout the three seasons to locate nests of this species, one was all that we discovered, and judging from the few ducks seen, as compared with the number of individuals of the other species, we were no doubt very fortunate in finding the one nest.

On May 31, 1907 we found a fine set of ten Ruddy's eggs in an excavation in the side of a large musk-rat house. Upon returning to this nest on June 8, we found another and newer nest in the same musk-rat house containing eight fresh eggs of the Canvasback. This was also an excavation in the side of the house, much deeper than that of the Ruddy (the eggs being fully eight inches from the

Fig. 66. NEST AND EGGS OF RUDDY IN EXPOSED POSITION ON TOP OF MUSKRAT HOUSE

entrance), and higher above the water line. The cavity was fairly well lined with white down, quite a quantity of which was also scattered about the entrance of the burrow. A week later (June 15) the full complement of fourteen eggs had been deposited, and covered with a thick layer of down. The female was surprised not far from the nest and afforded us a splendid opportunity for identification. These eggs hatched on or about July 6.

RUDDY DUCK (*Erismatura jamaicensis*)

Judging from the numbers of Ruddy Ducks seen throughout the three seasons on all the smaller marshy lakes, we should have found them nesting in considerable numbers, but three nests and a mixed set was the best that we could do.

The first, which has been mentioned above in connection with that of the Canvasback, was a mere burrow in the side of the musk-rat house, without any downy lining whatever, and only a few inches above the water level. On May 31 it contained ten eggs, on June 8, eleven, two of which were Canvasback's or Redhead's; and on June 30 all but two Ruddy's and one other egg had hatched, although one duckling had died while hatching.

Meanwhile on June 8, the Canvasback's nest was found on the opposite side of the musk-rat house and about four feet from it; and a new Ruddy's nest containing three fresh eggs was found on top of the house, and about midway between the other two nests and somewhat higher up. This was a mere unlined depression in the litter composing the house, entirely without concealment of any kind, and the great snowy white eggs could be seen from a distance of many yards. On June 22 the nest contained eight eggs, and on June 30 the set had not yet hatched.

The third nest, found June 15, 1907, hardly deserved the dignity of the term. It was merely a depression formed by trampling a tuft of tender marsh grass down to form a flimsy platform just at water level in a dense cat-tail swamp between two small lakes. When found it was over about two inches of water, and the under sides of the eleven fresh eggs were wet. A week later the water in the swamp had risen slightly and the nest was deserted. This was about ten yards from the nest containing thirteen Redhead's eggs mentioned above, and three of the eleven eggs it contained were indistinguishable from eggs in the Redhead's nest.

In all our visits to these three nests we did not see the birds leave a single time, although they sometimes swam about in front of us, some distance out on the lake. The apparent indifference of the brooding Redheads, Ruddys and Canvasbacks was in marked contrast to the devotion of the Teal and Pintails to their nests; and is very difficult to understand when the characteristic timidity of the last named species during the migration period is taken into consideration.

THE RELATION OF BIRDS TO AN INSECT OUTBREAK IN NORTHERN CALIFORNIA DURING THE SPRING AND SUMMER OF 1911*

By HAROLD C. BRYANT

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WITH FOUR PHOTOS BY THE AUTHOR

AS THE study of the economic relation of birds becomes more and more important, any information as to their use as checks in an outbreak of injurious insects furnishes data of pertinent value. If it can be proved that birds flock to places where insects are abundant or even that the resident birds feed largely on those at any time most obtainable, their service as checks on outbreaks of injurious insects will be established.

Professor S. A. Forbes in 1883 made a study of the relation of birds to an outbreak of cankerworms in an apple orchard in Illinois. The orchard was visited for two successive seasons and a number of the different species of birds present

* This paper is a report of work done in connection with the investigation into the food habits of California birds in their relation to agriculture. This investigation is being carried on by the California State Board of Fish and Game Commissioners, and the present report is published with their permission.

were collected. It was found that "birds of the most varied character and habits, migrant and resident, of all sizes from the tiny wren to the blue jay, birds of the forest, garden, and meadow, those of arboreal and those of terrestrial habits, were certainly either attracted or detained here by the bountiful supply of insect food and were feeding freely upon the species most abundant. That thirty-five percent of the food of the birds congregated here should have consisted of a single species of insect is a fact so extraordinary that its meaning cannot be mistaken." Professor Forbes also found that the same percentage of other caterpillars had been eaten by the birds in the orchard as had been eaten by birds taken in other localities and that the cankerworm ratios had apparently been added to those of other caterpillars.

Fig. 67. DEFOLIATED SNOW BRUSH (*Ceanothus cordulatus*), THE RESULT OF THE WORK OF THE LARVAE OF *Eugonia californica*. PHOTOGRAPH TAKEN NEAR SISSON, SISKIYOU COUNTY, CALIFORNIA, AUGUST 24, 1911

The most prolonged series of studies of the relation of birds to insect outbreaks was that by Professor Samuel Aughey, who for thirteen years studied the extent to which birds fed on the Rocky Mountain locust or grasshopper during the periodic outbreaks of that insect. His tabulated results show that birds of every description from the pelican to the tiny hummingbird fed to a very large extent on the grasshoppers.

The relation of birds to the army worm, which is one of the best known of the periodical pests, has received some investigation at the hands of the economic ornithologist. Professor B. H. Warren, the state zoologist of Pennsylvania, mak-

ing a careful investigation, found that a large proportion of the common birds fed upon the pests.

The remarkable plague of caterpillars followed by a pest of butterflies that has existed the past spring and summer (1911) in the northern counties of California, especially in Siskiyou County, has furnished an interesting example of an insect outbreak. The economic importance of the outbreak may not have been as great as in the case of some others, but the numbers of individuals and the extent of the plague mark it as one of the most notable in the history of the state. Reports as to the great numbers of the worms are meagre, but the defoliated brush throughout Siskiyou County, where the plague was most severe, bears mute testimony to their work. When great swarms of butterflies made their appearance, the aspect of the outbreak became so extraordinary that the newspapers published numerous, often exaggerated accounts, of the phenomenon.

From all accounts, the vicinity of Mount Shasta was most affected, both the worm and the butterfly being abundant at Weed, Igerna, and Sisson, three towns on the western base of the mountain. The worms were reported as being very abundant at Marble Mountain in western Siskiyou County and at Weaverville, Trinity County. Although no butterflies in any numbers were noticed at Redding, Shasta County, they were reported as very abundant in the mountains thirty-five miles east of that place.

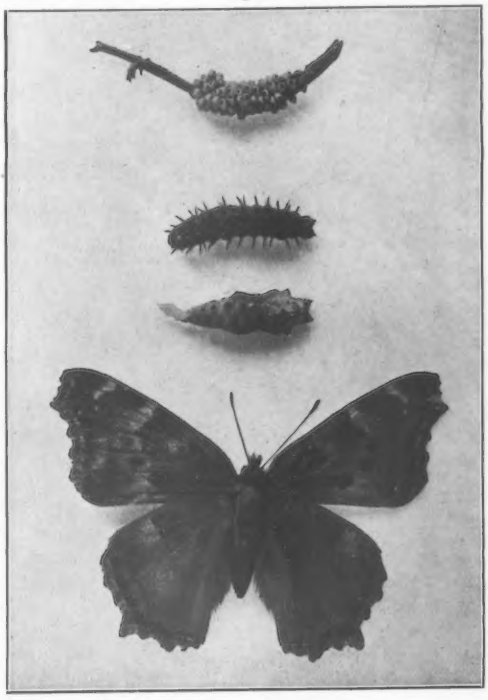

Fig. 68. THE LIFE HISTORY OF *Eugonia californica*. THE EGGS SHOWN ARE NOT THOSE OF *Eugonia californica* BUT THOSE OF A MOTH OF A TENT CATERPILLAR WHICH ALSO LIVES ON SNOW BRUSH. THE EGGS OF *Eugonia* ARE SIMILAR TO THESE AND ARE CLUSTERED ON A SMALL BRANCH IN MUCH THE SAME MANNER. NOTE THE STIFF HAIRS ON THE LARVA; THE SHAPE AND GENERAL CHARACTER OF THE PUPA, AND THE SIZE AND APPEARANCE OF THE ADULT

The following abstract is made from a letter by Honorable J. B. Curtin, dated September 11, describing a similar outbreak, of far less extent, in the Sierras. "Aspen Valley is a part of my cattle range and is at an elevation of six thousand three hundred and fifty feet. For a distance of about a mile each way, that would be east and west, the caterpillars have been traveling, going north. As far as I can learn, they are now in the central part of the county (Tuolumne) and have traveled perhaps thirty miles north from the south fork of the Tuolumne River. They fed only on snow brush, stripping each bush of its leaves."

Although no damage was done to crops, the outbreak furnished a splendid opportunity to study the relations of the birds in checking such a plague of insects. As the Fish and Game Commission is carrying on at the present time an investigation into the food habits of California birds in their relation to agriculture, evidence as to the part played by birds in this particular outbreak seemed to be of importance. Consequently an investigation was instituted under the auspices of the Commission.

The writer spent a week during the latter part of August at Sisson, Siskiyou County, collecting data by field observation and by the collection of birds for analysis of stomach contents. A total of sixty-one specimens, representing twenty-one species of birds, are at hand for stomach examination. A list of the species identified during the stay totals forty-five. It is to be regretted that a larger number of specimens representing a larger number of species is not at hand for examination, for the greater number would, without doubt, have not only augmented the number of species found to feed on the insects, but would also have esta blished points now in doubt.

To insure a complete understanding of the outbreak, a brief account of the life history and habits of the insect in question, follows.

As far as can be ascertained, the butterfly which has been so abundant in the north this year, has no common name. Among scientists it is known as *Eugonia californica*. It is closely allied to the members of the genus *Vanessa*, the tortoise-shell butterflies, species of which are known throughout the United States. *Euvanessa cardui*, a common butterfly of southern California appeared a few years ago in a swarm almost equal in extent to the plague of *Eugonia californica*.

There are four stages in the life of every butterfly and moth, egg, larva, pupa, and imago. From the egg hatches a caterpillar or larva. It is only in the larva stage that a butterfly or moth becomes of economic importance: nearly all of their larvae feed on vegetation. The depredations of the army worm, which is simply the larval form of a moth, are known only too well. The larva lives for some time on vegetation, then either hangs itself head down and is transformed into a chrysalis, spins a cocoon, or buries itself in the ground. This is called the pupa stage. After a week or more in this state there emerges the imago or adult form, a butterfly or moth. The butterfly or moth usually lives for several months or even for a year, then lays its eggs and the cycle is begun over again.

Eugonia californica lays its eggs on a common shrub of the mountains known as thorn brush, deer brush, buck thorn, buck brush, or snow brush (*Ceanothus cordulatus* and *Ceanothus velutinus*). In the early spring the larvae hatch from the eggs, crawl out on the foliage and begin to feed on the leaves. At the present time there are large areas in Siskiyou County where this brush is entirely defoliated as a result of the work of these larvae (see fig.67). By the middle of the summer, they have grown to be an inch or more in length and are ready to pupate. They then hang themselves head down on the under side of the branches and become pupae. In the defoliated areas, great numbers of pupae were found hanging from the under sides of the branches. Most of them were mere shells, as the butterfly had hatched, but large numbers were also found which had apparently been destroyed by birds and by parasites (see fig.69). A large hole picked into the thoracic portion of the pupae evidently showed the work of birds, whereas small round holes for the entrance and departure of some insect, gave evidence of the work of a parasite. Inside of a few weeks the butterfly or imago form emerges. Its food consists of what moisture and sap it can suck up on vegetation. The butterflies may possibly

mate and lay their eggs in the fall, but more often they live through the winter and lay their eggs in the early spring (see fig. 68).

In 1902 this same species of butterfly was abundant in the north. Since that time it has not been seen in any great numbers until this year. In the memory of the oldest inhabitants of Siskiyou County, the numbers of butterflies this year far exceed those of any previous year. The newspaper accounts were often exaggerated, and yet few people who did not see the swarms which filled the air, can have any realization of the great numbers. In order to get some idea of the numbers, counts were made. In damp places or along the banks of streams, where the butterflies had gathered to drink, as many as 150 individuals were counted in one square foot. Often the ground would be blackened by them for many square yards (see fig. 70).

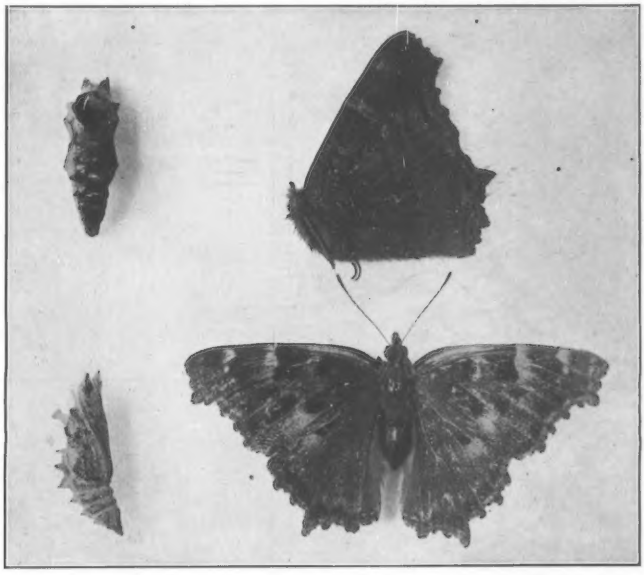

Fig. 69. PUPAE AND ADULTS OF *Eugonia californica*. IN ONE OF THE PUPAE, THE INSECT HAS BEEN DESTROYED BY SOME BIRD; IN THE OTHER BY SOME PARASITE. THE LATERAL VIEW OF AN ADULT SHOWS THE DARK UNDER SURFACE OF THE WING, AND THE DORSAL VIEW, THE COLOR PATTERN OF THE UPPER SURFACE.

In order to estimate the numbers flying, counts were made of the individuals passing between two fir trees about twenty feet high and standing about thirty feet apart. The counts for ten successive minutes between 4:40 and 4:50 P. M. on August 20, were as follows:

1st minute	105	6th minute	100
2nd "	119	7th "	96
3rd "	130	8th "	102
4th "	102	9th "	83
5th "	134	10th "	112
		Average per minute	108

Imagine the same numbers passing across a line a number of miles long, or better, across the breadth of Siskiyou County, and for say eight hours a day for several days; the numbers become incredible.

The butterflies were all migrating southward. In the early morning none were to be seen, but by half past nine they were in full migration. During the night they rested among the leaves on the trees or shrubs, on the sides of buildings or in any other convenient place.

With the life cycle taking but a year, it at first seems hard to explain why the numbers should be so much greater one year than another. One factor governing the phenomenon is the presence or absence of fortunate conditions for hiberna-

Fig. 70. BUTTERFLIES GATHERED TO DRINK AT A DAMP PLACE IN THE ROAD. PHOTOGRAPH TAKEN AT SISSON, SISKIYOU COUNTY, CALIFORNIA, AUGUST 23, 1911.

tion of the butterfly. As the pupae are parasitized to a large extent, in the neighborhood of 35 percent, and doubtless the larvae are also parasitized, the abundance or scarcity of these parasites must govern the numbers to some extent. A third factor, and without doubt an important one, is the part played by birds in the destruction of larva, pupa, and imago. Many of the pupae, 15 percent or thereabouts, apparently showed the work of birds, and as will be shown birds have an important part to play in the destruction of the butterflies. To what extent birds feed on the larvae is not known. Probably not to as great a degree as on the pupa and imago forms, for the larvae are well protected by stiff hairs. The scarcity or

abundance of food for either the larva or adult also has its influence. It will be seen, therefore, that the numbers of individuals from year to year depend on many factors, and that it is impossible to pick out any one as *the* factor. Probably it was a coincidence of several factors that caused the species to be so abundant this year.

In the investigation two methods were used, observation in the field and examination of stomach contents. Circumstantial evidence that a bird fed on the insects was not considered sufficient, so that unless the bird was actually seen to eat a butterfly or unless remains of butterflies were found in the stomach, the bird was not incorporated in the list of species known to feed on the insect. Doubtless if more time could have been spent in the field and more stomachs collected, the number of species acting as checks would have been found much larger. It is to be regretted that the field investigation was not begun sooner so that the kinds of birds feeding on the larvae and pupae might have been determined. In the vicinity of Sisson, Siskiyou County, where, August 20 to 25, the investigation was carried on, the larvae had all pupated and hatched into butterflies.

The writer is indebted to Professors C. A. Kofoid and C. W. Woodworth for valuable suggestions in the preparation of this paper and to Mr. J. Grinnell of the Museum of Vertebrate Zoology for a critical reading of the manuscript.

Field observation can seldom be depended on to furnish information as to the kind of food taken by a bird. In this investigation, however, the insects concerned were so large that there was no difficulty in determining positively whether the birds were feeding on *Eugonia californica* or on some other insect. The species of birds plainly seen to eat these butterflies were the Brewer blackbird (*Euphagus cyanocephalus*), western kingbird (*Tyrannus verticalis*), and western meadowlark (*Sturnella neglecta*).

By far the most efficient destroyer of the butterflies was the Brewer blackbird, (*Euphagus cyanocephalus*). From early morning till evening on every day during my stay at Sisson, great numbers of Brewer blackbirds could be seen congregated along the damp places in the road or in the meadows where the butterflies gathered, busily engaged in catching these insects. It was only in the near vicinity of the town that these birds were seen, but large flocks, in many cases numbering over a hundred individuals, were scattered about the small valley. Three particular flocks were closely watched.

A flock of some twenty-five individuals could nearly always be found in the near vicinity of the depot. They spent most of their time catching butterflies along the track, or about the damp places in the street just north of the depot. Between 11 and 12 o'clock on August 20, several of these birds, feeding in the road, were seen to take an average of five butterflies each minute. The method of capture was often quite crude. The bird seldom flew after an insect but simply walked along and attempted to pick it up. When a butterfly flew away, the bird either ran after it or attempted to catch another one. Occasionally a bird succeeded in swallowing a butterfly whole, but more often the insect was held with the feet while the body was torn from the wings. In places the ground was strewn with the discarded wings. Several times a bird was seen to catch a butterfly only to have it escape a moment later badly injured. One blackbird, either having had its fill or being attracted by another one of the insects, was seen to crush a butterfly in its bill and then drop it. Doubtless, therefore, these birds killed more than they really consumed.

Another large flock made its headquarters just west of town. On different occasions this flock was seen feeding along the railroad track in a meadow. When

frightened they perched in some nearby fir trees or on the telegraph wires. The third flock could always be found in the near vicinity of some meadow-land south of Sisson. Close observation failed to show them feeding on anything but butterflies.

The stomach examination of the few Brewers taken at this time substantiated the fact that their food was made up almost entirely of the butterflies. The stomach of one bird taken very early in the morning, when examined, was found to contain five *Eugonia californica* and parts of several others. A few grains of oats and parts of beetles were found in the stomach of a bird taken in a meadow near a stubble field. Birds collected the latter part of June and July contained a large percentage of beetles but no larvae or adults of *Eugonia californica*. Considering the comparative numbers of individuals of the different species of birds found to feed on the butterfly, the Brewer blackbird took 95 percent of the butterflies eaten by birds, the meadowlark 2½ percent and the kingbird, blue jay and Say phoebe shared the rest.

Only four western kingbirds (*Tyrannus verticalis*) were seen. Two birds perched on the telegraph wires along a road, were watched for some time. One of them was seen to catch two butterflies in the air. On another occasion two kingbirds were seen in the same general location, probably the same birds. They continually flew out from the wire and caught some insect in the air. As the air was filled with butterflies, it seems probable that these birds were catching them. Two kingbirds seen perched on a fence in a barnyard appeared also to be feeding on butterflies. It is to be regretted that no specimens are at hand for stomach examination, as the supplementary evidence, thus obtainable, would have thrown light on the extent to which the kingbird acts as a check.

Meadowlarks (*Sturnella neglecta*) were so shy that except in one case, it was impossible to determine the kind of food taken. A lone meadowlark feeding with some Brewer blackbirds on the grass plot adjoining the station was seen to run after several butterflies and to catch one. In the examination of seven stomachs, only two showed the remains of butterflies. All of the birds whose stomachs were examined, were taken in meadows or cut fields of wild hay where other insect life was abundant. Beetles and grasshoppers formed the bulk of the food.

A Say phoebe (*Sayornis sayus*) collected August 30, was found to contain a large butterfly of another species and also a *Eugonia californica*, as well as some ants. Since 75 percent of the stomach contents was composed of butterflies of different kinds and since, according to Beal (1910), these insects form more than 10 percent of the food of this bird for the year, it would appear that this flycatcher, as well as the kingbird, can be ranked as one of the checks on *Eugonia californica*. Doubtless another large flycatcher, the ash-throated flycatcher (*Myiarchus cinerascens*), took its share of the butterflies, for it is known to feed to a considerable extent on butterflies and moths. No specimens of this species are available.

If the food of the smaller flycatchers can be judged from that of the western flycatcher(*Empidonax difficilis*) it is doubtful if they bore any relation to the outbreak. The stomachs of the two western flycatchers examined, contained numerous small flies and a few small bees and beetles. A small white moth was found in one of the stomachs. Moreover it seems strange that a bird of its size should take so large an insect as the butterfly under discussion. No specimens of the western wood pewee (*Myiochanes richardsoni*) are at hand. Its food habits are known to be much like those of the western flycatcher.

The red-winged blackbird (*Agelaius phoeniceus*, subspecies ?) was very abund-

ant about Sisson. Flocks containing hundreds of individuals were often seen feeding on the meadow-land or on the stubble fields. They seemingly paid no attention to the hordes of butterflies but busied themselves searching for vegetable food. Stomach examination showed a considerable quantity of oats and other seeds, probably waste picked up in the stubble fields. A very small percentage of the food was made up of small ground beetles and grasshoppers.

Most of the Bullock orioles (*Icterus bullocki*) seen were feeding on huckleberries or other wild fruit. Eighty-two percent of the food in the stomachs examined was made up of wild fruit, mostly huckleberries and elderberries. The only animal food found consisted of wild bees.

The commonest sparrows were English sparrows (*Passer domesticus*) in town, Brewer sparrows (*Spizella breweri*) in the weed patches, and thick-billed fox sparrows (*Passerella iliaca megarhyncha*) in the brush. The English sparrow appeared to be feeding entirely on weed seeds as did also the Brewer sparrows. The stomachs of three Brewer sparrows were filled with weed seed and a few small beetles. The fox sparrow appeared to be largely a vegetarian also, for 96 percent of the food in two stomachs was composed of weed seeds. Parts of two ground beetles formed the only animal food. The stomach of a mountain song sparrow (*Melospiza melodia montana*) contained two cutworms, one unidentified larva, one beetle larva, and one small bee.

A bird of the brush, the green-tailed towhee (*Oreospiza chlorura*), was found to feed largely on small beetles and seeds, for the two stomachs examined were filled with these kinds of food only.

Only two species of woodpeckers were available for examination. As most of the members of this family feed very largely on larvae it seems probable that their use as checks would be most noticeable when the larvae were abundant. The one stomach of the woodpecker most likely to feed on the butterfly, the red-shafted flicker (*Colaptes cafer collaris*), failed to show any *Eugonia californica*. Two flickers, feeding on the ground, were watched for twenty minutes, but they paid no attention to the many butterflies. They walked along searching the ground carefully for some sort of food, in all probability ants. The stomachs of two white-headed woodpeckers (*Xenopicus albolarvatus*) were filled with vegetable matter, doubtfully identified as fungus, and a few beetles.

Blue-fronted jays (*Cyanocitta stelleri frontalis*) were often seen either climbing to the top of a fir or sailing from the tip top of one tall tree to a lower one. Only once was one seen feeding on the ground. Five *Eugonia californica* were found in one of the two stomachs examined. The other contained a number of large green larvae. It seems natural that a bird with the varied diet of the jay should turn to this particular form of insect food when it became available.

A western bluebird (*Sialia mexicana occidentalis*), perched on an old stump in a small grassy pasture, was watched for half an hour. It flew to the ground, caught a white moth, flew back to the stump and proceeded to tear it to pieces and eat it. During the next fifteen minutes it repeated the operation four more times, having within twenty minutes destroyed five moths. Butterflies were very abundant, but the bluebird appeared to prefer the smaller moths to the larger butterflies. Two stomachs were available for examination. One contained a number of small beetles and the other two grasshoppers.

Large flocks of western robins (*Planesticus migratorius propinquus*) could be found wherever wild fruit was abundant. Especially was this true where huckleberries were common. The flocks were made up largely of juveniles. An examination of thirteen stomachs gave evidence that their food at that particular

time of year is largely wild fruit. Over 99 percent of the food contained in the stomachs of six birds taken near the huckleberries, was made up of this fruit.

Cliff swallows (*Petrochelidon lunifrons*) were usually seen circling high in the air although on two occasions a number were seen perched on telegraph wires. These birds were carefully watched, but they did not seem to be feeding on the numerous butterflies about them. They certainly could have been seen to take butterflies if these had been chosen for food. A very few western barn swallows (*Hirundo erythrogastra*) were seen, but these too, seemed to be intent on catching some smaller insect. No stomachs are at hand for examination.

Mountain quail (*Oreortyx picta plumifera*) were very abundant in the brush. A flock was closely watched, but the birds appeared to be searching among the leaves under the brush for their food. As the mountain quail is largely a vegetarian, it probably bore no relation to the butterflies.

The stomachs of three mourning doves (*Zenaidura macroura carolinensis*) contained nothing but weed seeds.

One stomach of each of the following birds was also examined: belted kingfisher (*Ceryle alcyon*), western evening grosbeak (*Hesperiphona vespertina montana*), Cassin purple finch (*Carpodacus cassini*), Sierra junco (*Junco hyemalis thurberi*), and western house wren (*Troglodytes aedon parkmani*). There was no evidence that these birds fed on the butterflies. Judging from its food habits, it seems probable that the wren would be one of the birds to feed on the pupae. The Calaveras warbler (*Vermivora rubricapilla gutturalis*), another common bird of the brush, probably ranks with the western house wren in this regard.

Chickens and ducks seemed to appreciate the unlimited supply of butterflies, for they were seen catching them from early morning till late in the evening. In the vicinity of Sisson, at least, the domestic birds, on account of their capacity and numbers, by destroying butterflies performed a service nearly as great as all the wild species put together.

The following table gives a summary of the contents of the stomachs of birds taken during August, and the number of stomachs of each species examined.

NAME OF SPECIES	Number of Stomachs	Percent of Animal Food	Percent of Vegetable Food	Percent of Butterflies
Mourning dove (*Zenaidura macroura carolinensis*)	3		100.0	
Belted kingfisher (*Ceryle alcyon*)	1	100.0		
White-headed woodpecker (*Xenopicus albolarvatus*)	2	11.5	88.5	
Red-shafted flicker (*Colaptes cafer collaris*)	1	19.0	81.0	
Say phoebe (*Sayornis sayus*)	1	100.0		25.0
Western flycatcher (*Empidonax difficilis*)	2	100.0		
Blue-fronted jay (*Cyanocitta stelleri frontalis*)	2	74.0	26.0	30.0
Red-winged blackbird (*Agelaius phoeniceus*, subsp.?)	13	6.7	93.3	
Western meadowlark (*Sturnella neglecta*)	5	85.4	14.6	15.2
Bullock oriole (*Icterus bullocki*)	4	17.5	82.5	
Brewer blackbird (*Euphagus cyanocephalus*)	3	83.3	16.7	61.0
Western evening grosbeak (*Hesperiphona vespertina montana*)	1	74.0	26.0	
Cassin purple finch (*Carpodacus cassini*)	1		100.0	
Brewer sparrow (*Spizella breweri*)	3	47.7	52.3	
Sierra junco (*Junco hyemalis thurberi*)	1	100.0		
Mountain song sparrow (*Melospiza melodia montana*)	1	100.0		
Thick-billed fox " (*Passerella iliaca megarhyncha*)	2	4.0	96.0	
Green-tailed towhee (*Oreospiza chlorura*)	2	71.0	29.0	
Western house wren (*Troglodytes aedon parkmani*)	1	100.0		
Western robin (*Planesticus migratorius propinquus*)	10	13.7	87.3	
Western bluebird (*Sialia mexicana occidentalis*)	2	86.5	13.5	
Total number of stomachs	61			
Average percent of butterflies taken by four birds				32.8
Average percent of butterflies taken by all birds				6.2

Before taking up a discussion of the influence of birds on the checking of this particular outbreak of insects, it is necessary that there be given some idea as to the bird population of the territory affected. A list of the species recognized with certainty by the writer during his stay at Sisson, August 20 to 25, inclusive, 1911, follows.

1. Mountain quail. *Oreortyx picta plumifera.*
2. Mourning dove. *Zenaidura macroura carolinensis.*
3. Turkey vulture. *Cathartes aura septentrionalis.*
4. Western red-tailed hawk. *Buteo borealis calurus.*
5. Sparrow hawk. *Falco sparverius.*
6. Belted kingfisher. *Ceryle alcyon.*
7. White-headed woodpecker. *Xenopicus albolarvatus.*
8. Lewis woodpecker. *Asyndesmus lewisi.*
9. Red-shafted flicker. *Colaptes cafer collaris.*
10. Pacific nighthawk. *Chordeiles virginianus hesperis.*
11. Hummingbird. Species?
12. Western kingbird. *Tyrannus verticalis.*
13. Say phoebe. *Sayornis sayus.*
14. Western flycatcher. *Empidonax difficilis.*
15. Blue-fronted jay. *Cyanocitta stelleri frontalis.*
16. Red-winged blackbird. *Agelaius phoeniceus*, subspecies?
17. Western meadowlark. *Sturnella neglecta.*
18. Bullock oriole. *Icterus bullocki.*
19. Brewer blackbird. *Euphagus cyanocephalus.*
20. Western evening grosbeak. *Hesperiphona vespertina montana.*
21. Cassin purple finch. *Carpodacus cassini.*
22. Green-backed goldfinch. *Astragalinus psaltria hesperophilus.*
23. English sparrow. *Passer domesticus.*
24. Western Savannah sparrow. *Passerculus sandwichensis alaudinus.*
25. Brewer sparrow. *Spizella breweri.*
26. Sierra junco. *Junco hyemalis thurberi.*
27. Mountain song sparrow. *Melospiza melodia montana.*
28. Thick-billed fox sparrow. *Passerella iliaca megarhyncha.*
29. Spurred towhee. *Pipilo maculatus megalonyx.*
30. Green-tailed towhee. *Oreospiza chlorura.*
31. Lazuli bunting. *Passerina amoena.*
32. Western tanager. *Piranga ludoviciana.*
33. Cliff swallow. *Petrochelidon lunifrons.*
34. Western barn swallow. *Hirundo erythrogastra.*
35. Violet-green swallow. *Tachycineta thalassina lepida.*
36. Western warbling vireo. *Vireosylva gilva swainsoni.*
37. Calaveras warbler. *Vermivora rubricapilla gutturalis.*
38. California yellow warbler. *Dendroica aestiva brewsteri.*
39. Dipper or water-ouzel. *Cinclus mexicanus unicolor.*
40. Western house wren. *Troglodytes aedon parkmani.*
41. Red-breasted nuthatch. *Sitta canadensis.*
42. Mountain chickadee. *Penthestes gambeli.*
43. California bush-tit. *Psaltriparus minimus californicus.*
44. Western robin. *Planesticus migratorius propinquus.*
45. Western bluebird. *Sialia mexicana occidentalis.*

Brewer blackbirds, English sparrows and cliff swallows were the commonest birds found about the streets of the town. In the meadows, red-winged blackbirds, Savannah sparrows and meadowlarks were the only birds seen in any numbers. The red-wings were usually in flocks of several hundred, mostly juveniles. Wherever wild fruit was abundant robins and orioles could be found. In the brush green-tailed towhees were the commonest birds, but Calaveras warblers were also abundant. Only a few spurred towhees were noted. Western house wrens were more often heard than seen. Along the railroad tracks where the brush had been

cleared away and the weeds allowed to grow, Brewer sparrows were exceedingly common.

During an early morning walk through brush and forest the following birds were seen: blue-fronted jay, Brewer sparrow, green-tailed towhee, western house wren, bush-tit, Calaveras warbler, western robin, red-shafted flicker, and Lewis woodpecker. Within the space of three-quarters of an hour, five different species of birds were seen to perch in a dead cedar on a small hill. The tree was first visited by a Bullock oriole, then by a small flock of western bluebirds, four other Bullock orioles, two cliff swallows, which perched on the topmost limb, several purple finches and an evening grosbeak.

In a little meadow west of Sisson, where grass and weeds grew in abundance, a large number of birds were seen. In the weeds green-backed goldfinches and Brewer sparrows were feeding in large flocks. Several flickers were feeding on the ground. A lazuli bunting flew into a fir tree where several Calaveras warblers were at work. A sparrow was heard in a nearby tree. Several robins flew from one tree to another. A western bluebird was perched on a stump.

With the plague-ridden territory inhabited by so large a number of species of birds and by so large a bird population, it may at first seem strange that only five species of birds were found to feed on *Eugonia californica*. The investigation showed that only the larger birds fed on the butterfly. Certainly most of the small birds are ill-adapted for catching insects as large as the butterfly in question. Their most intimate relation to the outbreak was doubtless when the insect was in the larval and pupal stage. If all the birds smaller than the Say phoebe be eliminated from the list as being unable to act as checks on the butterfly, we find that over twenty-two percent of the species of the larger birds fed upon the butterfly. If we eliminate those of the larger birds, which judging from their food habits would not feed upon the butterfly, we find that almost forty percent of the possible species did feed upon the insect.

A striking fact is that the birds acting as checks, with one exception, that of the Say phoebe, are birds about whose depredations there is considerable complaint by the farmers of the state. That the blackbird, meadowlark, jay, and kingbird all do a certain amount of harm is undeniable, but too often only one side of the question is emphasized.

Especial attention is called to the fact that even such a bird as the blackbird, which is often classed as the worst pest of the farmer, may become of value at times and places where it is least expected. The present paper shows that the same birds that are often classed as harmful may be very beneficial in the checking of an insect outbreak.

Even though the brush attacked by the larva of *Eugonia californica* is seldom killed by the defoliation, yet the plants must be weakened to some extent. If the economic value of the brush be measured by its use as forage for deer and sheep, it will be seen that some importance, at least, attaches to this particular insect outbreak in that the defoliation took place during the summer when it was most needed as forage. The economic importance or non-importance of the outbreak, however, in no way affects the value of the principle involved in the relation of the birds to the epidemic; namely, that birds prey upon the insect food most abundant and therefore become factors in the checking of an insect outbreak.

In the life history of such an insect as *Eugonia californica*, we find the maximum number of individuals soon after hatching begins in the spring. From this time on there is normally a rapid decrease in numbers. The decrease is due to, not only the action of birds, which are perhaps the most constant factor in the de-

struction of larva and pupa, but also to parasitism. After the butterfly is hatched there is usually but a slow decrease throughout the winter. From this it will be seen that the butterfly has a far greater chance to survive than the caterpillar or the pupa. With this in view, almost half of the adults of *Eugonia californica* can be counted on to survive until egg-laying time. A much smaller percent of larvae or pupae could be counted on to survive till this stage owing to the greater death-rate. Any destruction of the butterfly, therefore, is an attack on the insect at a critical period in its life history. Consequently the work of five species of birds at this critical point might be more important as a check on the increase of the insect than the work of many more species during the larval and pupal stages. It appears also that in this particular case birds are among the very few natural checks on the butterfly, whereas parasites as well as birds probably play an important part as checks on the insect in its larval and pupal stages.

If we consider the work of one Brewer blackbird, its value as a check becomes apparent. Suppose that one of these birds having fourteen hours a day in which to feed, takes an average of one butterfly a minute for eight hours out of the fourteen. Judging from observations made, this would not be extraordinary. By the end of the day it would have consumed 480 butterflies, by the end of the week, 3360, and by the end of a month, over 100,000. If, say, a third of the butterflies destroyed were females, probably a larger percent are females, the numbers of eggs so destroyed would number near 336,000. Such computations as this are of somewhat doubtful value for they often seem so exaggerated that in the mind of the reader, the real facts are discounted. Its use here is simply to give some idea of the extent to which a bird might act as a check and probably did act as a check in this instance.

One of the most striking things brought out in the investigation was the great difference in the food habits of the red-winged and the Brewer blackbirds. Whereas the Brewer was found to feed almost entirely on the pests, the red-wing apparently paid no attention to the extraordinary abundance of insect food.

The results of investigation show that a good percentage of the birds larger than the Say phoebe fed on the butterfly, *Eugonia californica*, and this was without doubt a factor in the reduction of the insects. A comparison of birds taken at Sisson before the butterflies became abundant with those taken at the time of the investigation proved the fact that the birds varied their food ratios and took advantage of the abundant supply of this particular insect food.

SUMMARY OF RESULTS

The investigation instituted by the State Fish and Game Commission into the relation of birds to an insect outbreak in northern California during the spring and summer of 1911, showed the following results:

1. The insect which became a pest was a butterfly, *Eugonia californica*, the larval form of which feeds upon snow brush or buck brush (*Ceanothus cordulatus*, *Ceanothus velutinus*).

2. The great number of caterpillars and butterflies and the large amount of territory covered by the plague furnished an interesting example of an insect outbreak. Since the relation of birds to any insect outbreak furnishes important information as to their economic value as checks, the value of an investigation into the relation of birds to this particular outbreak was evident.

3. Five species of birds were found to feed on the butterfly, *Eugonia californica*, the Brewer blackbird (*Euphagus cyanocephalus*), western meadowlark

(*Sturnella neglecta*), western kingbird (*Tyrannus verticalis*), blue-fronted jay (*Cyanocitta stelleri frontalis*), and Say phoebe (*Sayornis sayus*).

4. Four out of five species found to feed on the butterfly are numbered among the birds whose usual food habits justly subject them to severe criticism from the farmer.

5. The Brewer blackbird (*Euphagus cyanocephalus*) was found to be the most efficient check both on account of numbers and food habits. When the comparative number of individuals of the different species of birds were considered, it was found that the Brewer blackbird took 95 percent of all the butterflies eaten by birds. In this particular outbreak, therefore, one species of bird rather than birds in general, played the greatest part in the destruction of the insect.

6. The examination of thirteen stomachs of the red-winged blackbird (*Agelaius phoeniceus*, subspecies?) showed over 93 percent of its food to be vegetable matter, thus bringing out the vast difference in food habits between this bird and the Brewer blackbird (*Euphagus cyanocephalus*), 83 percent of whose food was animal matter.

7. *Eugonia californica* in the butterfly stage, probably on account of its large size, was not eaten by any species of bird smaller than the Say phoebe. The smaller birds probably had a more intimate relation to the outbreak when the insect was in the larval and pupal stage.

8. The birds in feeding on the butterfly attacked the insect at a critical point in its life history and were therefore of more value as a check than they would have been had they fed on the larva or pupa.

9. A comparison of the food of birds taken before the plague with that of birds taken while the plague was at its height, showed that birds had varied their food habits and had taken advantage of the abundant supply of insect food in the form of butterflies. Their value as checks in this particular insect outbreak, therefore, was real.

10. The data collected shows of what value birds may be in the checking of an insect outbreak rather than their value in the prevention of an outbreak.

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FURTHER NOTES FROM SANTA CRUZ ISLAND

By ALFRED B. HOWELL and A. VAN ROSSEM

THE topography of Santa Cruz Island is more varied than that of any other of the islands comprising the Santa Barbara group, and it has a corresponding diversity of bird life. Its greatest altitude is nearly three thousand feet; for the most part it is grass land with extensive barren stretches, and canyons filled

with oak trees and scrubby growth. There is one tract, however, that appears to possess a touch of boreal at its highest part. It is composed of dense forests of the Santa Cruz pine, broken by precipitous dark gorges, with growth that strongly reminds one of northern Oregon. Here in this pine region we stayed from April 24 until May 2, 1911.

Mr. C. B. Linton during his long visit to this island in 1907 (CONDOR X, 1908, pp. 124-128) has given us such an excellent list of the birds which occur there that we deem it unnecessary to do more than record those of the sixty-six species we observed which are not in his list, and to mention facts of especial interest.

Aechmophorus occidentalis. Western Grebe. At least one seen.

Lunda cirrhata. Tufted Puffin. Rather common, and reported by the fishermen as breeding at the northern end of the island.

Larus glaucescens. Glaucous-winged Gull. A group of three seen.

Larus delawarensis. Ring-billed Gull. Not rare.

Larus philadelphia. Bonaparte Gull. Several seen.

Accipiter cooperi. Cooper Hawk. One pair in the pines acted as if it had a nest near by, but we were unable to locate it.

Buteo swainsoni. Swainson Hawk. A single bird flew over, permitting a close inspection.

Haliæetus leucocephalus. Bald Eagle. Rather common, both adults and immature birds of last year. One pair had a nest in a pot-hole on a cliff along the shore, and another was about thirty feet up in a pine on the side of a canyon. It was occupied by one young the size of a large chicken, and the old birds were very aggressive.

Aluco pratincola. Barn Owl. One seen flying silently over camp just after dark.

Colaptes cafer collaris. Red-shafted Flicker. The flickers of Santa Cruz present an interesting problem which can be solved only by one who has the time to collect a large series of them. Unfortunately we were unable to get a shot at any but typical *collaris*. This is by far the commoner form, but others, by no means rare, certainly closely approach the Northern Flicker (*C. a. luteus*), and still others appear to be intergrades between the two.

Otocoris alpestris insularis. Island Horned Lark. Although we searched diligently no Island Horned Larks were found. We looked in suitable localities, rolling grass land, but they are evidently of local distribution, as other observers have reported them as common.

Aphelocoma insularis. Santa Cruz Jay. To us the most interesting bird on the island. Abundant in the pines. They were not as much in evidence as their cousins on the mainland, but when one did happen upon them they were as a rule unsuspicious. At this time of year they are quiet unless one of a pair is killed or a nest disturbed, and if one does not know where and when to find them they might almost escape notice. However, if one goes along with much noise, so that the jays know he is about, and then sits down at a convenient spot and remains quiet, their curiosity will get the better of them. In nine cases out of ten it is useless to watch in front because the birds will not come that way, but after several minutes, upon a surreptitious glance to the rear, a jay will be discovered sitting motionless on a pine branch a few yards away. Practically all of their nests contained young at this date. Two nests examined were placed about twenty feet up in "palo fierros", slim trees growing in small groves in the valleys, and were similar in construction to nests of the California Jay. One contained two small young and an addled egg, and the other had four young about a week old. A surprising

number of old nests were found, placed usually in the palo fierros or tall bushes, but sometimes in the pines.

Corvus corax sinuatus. Raven. Common. Two nests on the cliffs not twenty feet apart held tiny young.

Carpodacus mexicanus clementis. San Clemente House Finch. Exceedingly abundant near the shore where there were cacti and suitable caves, in the roofs of which to nest. One nest discovered held four incubated eggs, and an addled egg of the Western Flycatcher. As is not unusual with this form, great diversity of markings was encountered. Several males were taken with the usual scarlet replaced by yellow, and others in which the two colors were commingled; also one male in breeding condition marked precisely like a female except for five yellow feathers beneath the chin; and a female with a yellow rump.

Loxia curvirostra stricklandi. Mexican Crossbill. We were greatly surprised to find this bird in some numbers in the heavy timber at the top of the island, and in the short time that we were able to give to this section sixteen birds were seen. Some were in pairs and others in small companies. I believe it is highly probable that these birds are resident on the island, as the character of the country is suitable and May 1 seems rather late for them to be present if they were winter visitants only. The four individuals obtained are very large.

Zonotrichia leucophrys gambeli. Gambel Sparrow. Sparingly scattered over the brushy hillsides in pairs.

Zonotrichia coronata. Golden-crowned Sparrow. Two birds still present.

Aimophila ruficeps. Rufous-crowned Sparrow. Rather common in suitable places. One of the females of two pairs within fifty yards of camp, was incubating when shot April 26, as the absence of feathers upon her belly indicated.

Melospiza melodia graminea. Santa Barbara Song Sparrow. Two heard but none seen. They are common on other parts of the island, however.

Pipilo maculatus clementae. San Clemente Towhee. Not rare.

Hirundo erythrogastra. Barn Swallow. Abundant; frequently visiting a small spring near camp to obtain mud which they carried to the caves above the sea.

Lanius ludovicianus anthonyi. Island Shrike. Rare at this point as but two were seen, neither of which we obtained. They were remarkably wary.

Dendroica auduboni. Audubon Warbler. Several seen.

Thryomanes bewicki charienturus. *San Diego Wren. Common everywhere* and at this time feeding young.

Sitta canadensis. Red-breasted Nuthatch. Shared the Crossbills' range. About two dozen were seen and six taken. One bird was watched for half an hour while she was busily engaged in preparing a nesting site, so the species is resident. Those obtained average smaller than birds from the mainland and the east.

FROM FIELD AND STUDY

Tree-nests of the Point Pinos Junco and Other Notes.—The 27th of March, 1910, like many of the days that preceded it, was rainy. Mr. Henry W. Carriger and I, however, had previously decided on an outing, and although the inclement weather delayed, it did not deter us from starting for our destination in northern San Mateo County. This we reached in the early afternoon. To be exact it was the very locality described at length by Carriger and Pemberton in THE CONDOR as being the site of a Siskin colony.

Our first nest, one of the Point Pinos Junco (*Junco hyemalis pinosus*), was a strange depart-

ure from all previously recorded nest situations being placed 8 feet up in a Monterey cypress where it was well hidden in a thick clump of foliage. The nest, a well built structure consisting almost entirely of pine needles, contained four eggs in which incubation had begun. A second nest of the junco was found 16 feet up in the Monterey cypress in an open situation well out on the limb, and contained fresh eggs. This nest is even a better built structure than the first one found. It is a *very* compact affair of pine needles, roots, grasses and weed stems and well lined with various animal hair. (This nest was revisited on March 31 at which date the number of eggs had increased to four.) It might be inferred that on account of the extreme dampness of an unusually rainy spring the juncos had selected these elevated nesting sites in preference to the customary ground-locations. Whether this theory is correct or not it is interesting to note that we found a ground-nest on April 16 with young fully a week old. This nest was placed near the foot of a tree which, however, offered but little protection. There has been some question raised as to the identity of the juncos breeding in the region bordering the foothills in San Mateo County; but Mr. J. R. Pemberton who collected examples in this locality pronounced them typical *pinosus*.

Of more than passing interest were two nests found of the Santa Cruz Chickadee (*Penthestes rufescens barlowi*) both in natural cavities in Australian eucalyptus trees. The first, found by Carriger, held two eggs apparently deserted. The second, found by the writer, held seven fresh eggs which were placed in a cavity four feet above the ground and warmly lined with a great quantity of fur, red cow-hair and soft dry green moss. In this instance the sitting bird was flushed, although with Chickadees this is a circumstance of considerable rarity.

Other nests noted on the afternoon's outing were one of the California Shrike (*Lanius ludovicianus gambeli*) freshly built, one of the Green-backed Goldfinch (*Astragalinus psaltria hesperophilus*) nearly completed, and one of the Allen Hummingbird (*Selasphorus alleni*) with two fresh eggs. All three nests were placed in Monterey cypress trees.—MILTON S. RAY.

Bobolink in San Mateo County, California.—Mr. Vernon Shephard, taxidermist, of 28 North Stanyan Street, San Francisco, California, has recently donated to the Museum of Vertebrate Zoology of the University of California a specimen (no. 19731) of Bobolink (*Dolichonyx oryzivorus*). The bird was taken by Mr. Shephard between June 5 and 10 near San Bruno Lake in San Mateo County. The bird is a male in "nuptial" plumage.—W. P. TAYLOR.

Notes from Alaska.—The University of California Museum of Vertebrate Zoology has recently received as gifts from Mr. Allen Hasselborg of Juneau, Alaska, specimens of birds taken by him in southern Alaska, some of which are of sufficient interest to justify the recording of their capture. A letter accompanying the last skins received contains brief notes on these and additional species, and extracts from it are appended below. The compiler of these notes can vouch for Mr. Hasselborg's thorough acquaintance with the species referred to, and there need be no hesitation in accepting the records in the two cases where specimens were not taken. The numbers pertain to the bird collection of the Museum.

Gavia adamsi. Yellow-billed Loon. Adult, not sexed, head only saved. Mole Harbor, Admiralty Island, May 25, 1911 (no. 19119).

Adult male; "off Dixon Harbor" (on the mainland, a little north of Cross Sound); August 17, 1911 (no. 19728). He further remarks "I have seen three others this year [1911] one about the first of June, off Point Hugh [southernmost point of Glass Peninsula, Admiralty Island], one in the Favorite Channel [at south end of Lynn Canal], June 5, and one in Berner's Bay [east shore of Lynn Canal], June 17. Last year I saw one off Lituya Bay about June 20, and one in Gastineau Channel [between Douglas Island and the mainland] in November."

These records of the Yellow-billed Loon are of interest, as the various expeditions sent to the region by the Museum of Vertebrate Zoology failed to secure any specimens. In 1907 a single bird was seen at Windfall Harbor, Admiralty Island (see Grinnell, Univ. Calif. Publ. Zool., vol. 5, 1909, p. 182); on the 1909 expedition, which traversed the length of the Alexander Archipelago, the species was not encountered at all.

Picoides americanus. American Three-toed Woodpecker. Three specimens, all from Admiralty Island; adult female, Oliver Inlet, January 1, 1910 (no. 16716); adult male, Kanalku Bay, June 18, 1910 (no. 16717); adult male Seymour Canal, November 15, 1910 (no. 19729).

He also found two nests at Berner's Bay, in June, 1911, but was unable to examine them.

Chaetura vauxi. Vaux Swift. "I saw Vaux Swifts repeatedly in June and July in the big valleys running back from Berner's Bay, and on August 24 saw four in the valley at the head of Excursion Inlet." Excursion Inlet is on the northern shore of Icy Strait, between Lynn Canal and Glacier Bay.

Zonotrichia coronata. Golden-crowned Sparrow. "On June 21 I saw a Golden-crowned Sparrow at 2500 feet elevation at Berner's Bay, and believe it was nesting."—H. S. SWARTH.

Correction. In "Some Birds of the San Quentin Bay Region, Baja California", on page 152 of the last issue of THE CONDOR, Long-billed Curlew (*Numenius americanus*) should read Hudsonian Curlew (*Numenius hudsonicus*) the writer having made this blunder in writing up the article from his notes.—ALFRED B. HOWELL.

THE CONDOR

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EDITORIAL NOTES AND NEWS

There is a growing custom among museum and private collectors concerning which a word of caution may be in order. We refer to that of securing the services of missionaries, traders, prospectors, and others not well versed in ornithology to gather eggs of rare northern birds, these eggs to be preserved and distributed as scientific specimens. It is extremely difficult in many cases to insure accurate identity of the various geese, ducks, waders and gulls even by the trained field naturalist. Although a few bird skins may have been saved, the discrimination of species on the ground where scores of individuals representing many species nest in close proximity to one another, is a difficult matter. The tendency to *gather in* a big showing is liable to overcome the best of intentions with regard to accuracy. The grave danger scientifically comes of course when data accompanying such eggs is published. We have no doubt but that there are many bad records in our literature traceable to some such source. This danger should be vigorously guarded against, even if by so doing a museum collection does not grow so rapidly.

Mr. J. H. Riley and Mr. N. Hollister, both of the staff of the United States National Museum, spent a portion of the past summer collecting in western Alberta and eastern British Columbia. Specimens, practically topotypes, of Gray-crowned Rosy Finch, White-tailed Ptarmigan and Franklin Grouse, were obtained.

Part V of Ridgway's "Birds of North and Middle America" is reported almost ready for distribution, Mr. Ridgway being now occupied upon Part VI. His color book is to be expected shortly as all the color work has been done and only the text remains to be printed.

Mr. G. Willett's "Birds of Southern California" is nearly ready for the printer. It is to be published by the Cooper Ornithological Club as Pacific Coast Avifauna No. 7, and distributed free to all members. Its cost will be defrayed by private subscription. Mr. Willett's contribution will consist of an exhaustive compilation of all that is known to date in regard to the manner of occurence of the birds of that part of southern California lying west of the desert divide. We look forward with great interest to the appearance of this carefully executed work.

There will shortly appear from the University of California Press two notable papers chiefly of an ornithological nature. These are: Mr. H. S. Swarth's report upon the Alexander Expedition to Vancouver Island in 1910, and the concluding part of Mr. W. P. Taylor's report upon the field work of the Alexander Expedition to Nevada in 1909.

Mr. W. Leon Dawson spent a goodly portion of the field season just closed in out-door work contributory to his projected "Birds of California." The Farallone Islands and the Mount Whitney region shared in this year's attention, each locality contributing to Mr. Dawson's stock of first-hand ornithology. The editor of THE CONDOR has been privileged to examine some of the photos obtained, and he enthusiastically asserts that they include some of the most successful bird photographs he has ever seen.

PUBLICATIONS REVIEWED.

BIRDS AND MAMMALS OF THE 1909 ALEXANDER ALASKA EXPEDITION BY HARRY S. SWARTH. [=Univ. Calif. Publ., Zool., VII, pp. 9-172, pls. 1-6; Jan. 12. 1911].

In continuation of its well-planned and well-executed campaign in Alaska, the University

of California Museum of Vertebrate Zoology presents this liberal measure of results for a single season's work. The author, with one assistant, Mr. A. E. Hasselborg, spent the six months from April to October in visiting sixteen islands and six mainland localities in southeastern Alaska, reaching practically all important points not covered by the previous expedition of 1907. Somewhat more than 1000 specimens of birds and mammals were collected and a great amount of trustworthy information obtained. The list of birds totals 137 forms of which the 31 not attested by specimens are mostly included upon the careful observation and competent authority of the author himself. The extended critical and ecological notes bristle with facts new, interesting, and pertinent to particular problems. The notes on spring migration are especially welcome as very few observations have been made in this region earlier than May and June. In spite of the evident active field work done, one notes with no surprise that but little is recorded of nesting habits and the more intimate features of the bird life. Such matters must be left to local observers, for the itinerant collector in virgin fields can never spare the time for them. The critical notes are rather too numerous for specific mention, but it may be said that they carry a spirit of fairness and in a number of cases matters are presented in a new light or with additional and highly pertinent material tending to elucidate the status of various species and subspecies. Among the forms touched upon in this manner are *Macrorhamphus griseus scolopaceus, Buteo b. alascensis, Picoides a. fumipectus, Dryobates v. harrisi, D. p. glacialis, Passerculus s. savanna, Junco oreganus, Hirundo e. palmeri* and *Dendroica c. hooveri*. No new forms were discovered, and in view of the large collections and their careful study, this seems to indicate that possibilities in this direction are well nigh exhausted in a long productive region.

A very interesting section of the report, devoted to "Distributional Considerations," is all too short, although the modest statements of facts and conditions which it includes are perhaps better without ingenious elaboration of the theories to which they might lend themselves. In finding no faunal relationship between Prince of Wales Island and the Queen Charlotte group, the author is at variance with former writers who had the advantage of the possession of extensive material from both localities.

Doubtless he is right as to the reference of specimens, but we venture the belief that the Queen Charlotte forms are approached more closely by specimens from Prince of Wales Island and nearby islets than from elsewhere. Arrangement, typography, and proofreading are above reproach, but the fastidious might ask for a more dignified abbreviation than Grin. for Grinnell, especially as we do not find on the same page, corresponding abridgments to Les., Lin., Nut., and Pal.—W. H. OSGOOD.

THE WARD-MCILHENNY WILDFOWL REFUGE. By CHARLES WILLIS WARD [=Forest and Stream, vol. LXXVII, no. 5, July, 1911, pp. 167-170, 5 ills.]

It is hard to overestimate the practical value of such game protection as is here described. To set aside large tracts of suitable land (there are 13,000 acres in this refuge) on which absolutely no shooting is allowed, will most assuredly protect the game thereon, while, as the writer says, "laws limiting their killing, prohibitions of the sale of game, societies for the protection of game, all seem inadequate to prevent the steady destruction of wild life". Of game laws, supposedly protective, but too often juggled with and adjusted to benefit various coteries of shooters, rather than the game, we have a superabundance, frequently so complicated and contradictory in different parts of the same state that it is hard for the conscientious sportsman to obey, and frequently easy for the unscrupulous to evade them. After years of experimentation along the same general lines we are forced to admit that our present system of game preservation is a failure, and that unless some radical changes are made, many of our game birds and mammals, and many non-game birds as well, are certain to disappear. Some have already gone. The "game refuge" idea holds out a gleam of hope. It looks practical and reasonable, and, linked with sensible restrictive laws covering the country at large, should do much to arrest the deplorable decrease of animal life. It is an undertaking that should be carried out by the various state governments, but the states are slow to move in such matters, and any private individuals stepping in meanwhile and doing as Messrs. McIlhenny and Ward have done deserve the fullest measure of praise and credit for their work. They seem to be going ahead in an eminently practical and unsentimental way. Sportsmen themselves, and fond of shooting, they are attacking the problem from the standpoint not that it is wrong to kill for sport but that it is eminently foolish and unsportsmanlike to utterly destroy so valuable an asset as the game of a country, and leave nothing for the morrow. We wish them the fullest measure of success. Their efforts should be given the widest publicity, and the results studied carefully. Would that other wealthy men could be found to attempt the same thing elsewhere; such refuges are badly needed in our own state, and could prob-

ably be established at a comparatively low cost.

In this same number of Forest and Stream (page 197) there is a brief editorial account of a heronry on the McIlhenny estate. It is stated to contain at least 100,000 birds, including the following species: Snowy Heron, Little Blue Heron, Louisiana Heron, Green Heron, Yellow-crowned Night Heron, and Egret; and has been built up from a very few pairs, simply by carefully protecting the birds at all times.—H. S. S.

MINUTES OF COOPER CLUB MEETINGS

SOUTHERN DIVISION

JUNE—The June meeting of the Southern Division of the Cooper Ornithological Club was held on Thursday evening, June 28, 1911, in the office of H. J. Lelande, 246 Wilcox Building, Los Angeles.

The meeting was called to order by President Morcom, with the following members present: Messrs. Robertson, Willett, Alphonse Jay, Judson, Granville and Lelande.

On motion by Mr. Robertson, seconded by Mr. Willett, and duly carried, Mr. Lelande was appointed Secretary pro tem.

The minutes of the May meeting were read and approved.

On motion by Mr. Robertson, seconded by Mr. Judson, and duly carried, the Secretary was instructed to cast the unanimous ballot of those present electing to active membership Misses Kellogg and Blayney, and Messrs. Walker, Hamilton, Smith, Evermann, Carriker, Shaw, Rust, Stevens, Jordan, Barbour, Nehrling, Kermode, Wells, Durfee, Mueller, Barker and Lane, whose names were presented at the May meeting. The following application for membership was presented: Eleanor Poitevent Earle, Palma Sola, Florida, proposed by A. B. Howell.

A communication from Mr. Frank S. Daggett to Secretary Law was read. In this letter Mr. Daggett stated that there was a probability of his making his permanent residence in California; all those present being very much pleased to hear such good news.

The following papers were read: "Further Notes from Santa Cruz Island" by A. B. Howell and A. Van Rossem; "May Notes from San Jacinto Lake" by G. Willett and Antonin Jay; and "An Early Spring Trip to Anacapa Island" by Homer L. Burt. Adjourned.—H. J. LELANDE, *Secretary, pro tem.*

JULY—The July meeting of the Southern Division of the Cooper Ornithological Club was held on Thursday evening, July 27, 1911 at the office of H. J. Lelande, 246 Wilcox Building, Los Angeles.

In the absence of the President the meeting was called to order by Vice-President H. J. Lelande with the following members present: Messrs. H. C. Tracy, Howard Robertson, Otto Zahn, A. Jay, George Willett, H. J. Lelande, W. Lee Chambers. In the absence of the Secretary Mr. W. Lee Chambers was appointed by the Chair as Secretary pro tem.

The minutes of the June meeting were read and approved.

On motion duly made and carried, Mrs. Eleanor P. Earle was elected to active membership.

The following applications for membership were presented: Thos. M. Trippe, Howardsville, Colorado, W. Linfred Dunbar, Bridgeport, Connecticut; E. J. Court, Mt. Pleasant, Washington and Mrs. J. H. Lancashire, Alma, Michigan; all proposed by Mr. A. B. Howell; and Miss Gretchen L. Libby, Redlands, California, proposed by Mr. H. S. Swarth.

The minutes of the Northern Division for the July meeting were read. Also three papers were read by Mr. Lelande as follows: "A Hybrid Quail" by M. E. Peck; "Some Colorado Horned Owl Notes" by E. R. Warren; and "Swallow Notes from Fresno" by J. G. Tyler.

Mr. George Willett presented some preliminary notes from his forthcoming "Birds of Southern California", which were very interesting and brought out much discussion. Adjourned—W. LEE CHAMBERS, *Secretary pro tem.*

AUGUST—The August meeting of the Southern Division of the Cooper Ornithological Club was held on Thursday evening, August 31, 1911 at the office of H. J. Lelande, 246 Wilcox Building, Los Angeles. In the absence of the President, the meeting was called to order by Vice-President Lelande, with the following members present: Messrs. George Willett, Loye Holmes Miller, W. Lee Chambers, Antonin Jay and J. E. Law.

The minutes of the July meeting were read and approved. On motion duly made and carried, Mrs. J. H. Lancashire, Miss Gretchen L. Libby, Messrs. Thomas M. Trippe, W. Linfred Dunbar and E. J. Court proposed at the July meeting were duly elected to active membership. The applications of E. J. Darlington, Wilmington, Delaware, proposed by A. B. Howell, and Bernard Bailey, Corvallis, Montana, proposed by H. S. Swarth, were presented. On motion by Mr. Willett, seconded by Mr. Miller and duly carried, the resignation of Mr. Chas. Reining was accepted with regret. The Secretary then read a very interesting article on the nesting of the Anthony Vireo, accompanied by two cuts, by Jennie V. Getty. This article describes the taking of the first set of four eggs of this bird and other

interesting nest notes. Adjourned.—J. E. LAW, *Secretary.*

NORTHERN DIVISION

JULY—The July meeting of the Northern Division of the Club was held at the Museum of Vertebrate Zoology, Berkeley, on Saturday evening, July 22. Vice-President Carriger was in the chair, and the following members were present: M. S. Ray, J. J. Boyce, O. Heinemann, H. C. Bryant, L. H. Miller, H. L. Coggins, Miss Winifred Wear, and H. S. Swarth. Miss Gretchen L. Libby and Miss Wear were present as visitors. The minutes of the last meeting (held on April 22) were read and approved, and the minutes of the June meeting of the Southern Division were also read.

The following individuals were elected to membership in the Club: H. Parker, S. S. Visher, L. H. Paul, M. S. Crosby, L. M. Terrill, W. J. Brown, A. H. Helme, C. M. Case, L. Tremper, G. Wells. Applications for membership were read as follows: R. P. Sharples, W. W. Arnold, T. M. Trippe, Eleanor P. Earle, B. W. Evermann, F. Smith, M. A. Carriker, Jr., B. A. Hamilton, A. Walker, all proposed by A. B. Howell; and Miss Gretchen L. Libby, Redlands, California, proposed by H. S. Swarth. There was some discussion of the proposed revision of the Club Constitution, but in the absence of two members of the committee having the matter in charge, no action was taken.

Mr. Boyce gave a talk on some of his experiences collecting water birds on Forrester and Hazy islands, in southeastern Alaska, he having made the dangerous landing on these rather inaccessible islands, on several occasions. Mr. Carriger read a letter from J. R. Pemberton, now engaged in geological work in Patagonia, giving his impressions of the bird life of that region, as compared with that of California. and telling of some of the more striking species.

A paper by M. E. Peck was then read, descriptive of a hybrid quail; a cross between the Mountain and Valley Quail, accompanied by the specimen. Adjourned.—H. S. SWARTH, *Secretary.*

AUGUST—The regular monthly meeting of the Northern Division of the Club was held at the Museum of Vertebrate Zoology, Berkeley, on Saturday evening, August 19. Vice-president Carriger was in the chair, and the following members were present: Chester Lamb, M. P. Anderson, D. Brown, and H. S. Swarth. Mr. George J. Barron was present as a visitor. The minutes of the July meeting were read and approved, followed by the Southern Division minutes for July.

The following, whose names were presented at the last meeting were elected to membership in the Club: Alex Walker, Dr. B. A. Hamilton, M. A. Carriker, Jr., F. Smith, B. W. Evermann, T. M. Trippe, Dr. W. W. Arnold, R. P. Sharples, Mrs. E. P. Earle, and Miss Gretchen L. Libby. New names proposed for membership were, E. J. Court, Washington, D. C.; W. L. Dunbar, Bridgeport, Conn.; and Mrs. J. H. Lancashire, Alma, Mich., all proposed by A. B. Howell; and Bernard Bailey, Corvallis, Montana, proposed by H. S. Swarth. Adjourned.—H. S. SWARTH, *Secretary.*

SEPTEMBER.—The September meeting of the Northern Division was held at the Museum of Vertebrate Zoology, on Saturday evening, September 16. President Mailliard was in the chair and the following members present: Miss A. M. Alexander and Miss L. Kellogg, and Messrs. M. P. Anderson, W. P. Taylor, O. Heinemann, J. Grinnell, H. C. Bryant, J. Boyce, C. Camp, H. W. Carriger, R. S. Wheeler and H. S. Swarth.

The minutes of the Northern Division August meeting were read and approved, followed by the reading of the Southern Division minutes for August. The following were elected to membership in the Club: W. Linfred Dunbar, Bridgeport, Conn., Edward J. Court, Washington, D. C.; and Mrs. J. H. Lancashire, Alma, Mich., all proposed by A. B. Howell; and Bernard Bailey, Corvallis, Montana, proposed by H. S. Swarth. The name of E. J. Darlington, Wilmington, Delaware, was presented by A. B. Howell, and J. S. Douglas, Bakersfield, Calif., by W. Lee Chambers, to be acted upon at the next meeting. The resignation of Charles Reining, Davenport, Iowa, was accepted.

A communication from Mr. Chambers was then read, giving an informal statement of the present financial status of the Club, a very gratifying exposition of the work accomplished by the business managers during the past year.

The committee on the revision of the Club constitution (J. Mailliard, W. P. Taylor, and O. Heinemann) presented its report. Several slight changes and additions were suggested, and the whole document was then formally approved, to be sent at once to the Southern Division before its final adoption.

Mr. M. P. Anderson gave an entertaining talk descriptive of his experiences in western China and Thibet, where he spent some years collecting birds and mammals for the British Museum. After briefly indicating his route and collecting stations, illustrated by a map, he spoke of the more conspicuous mammals and birds, and also of the hunting methods employed by the natives of the country. Adjourned.—H. S. SWARTH, *Secretary.*

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